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U.S. Army Environmental Center
Environmental Technology Division
Edgewood Area
Aberdeen Proving Ground, Maryland

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EVALUATION OF A TRANSPORTABLE HOT-GAS DECONTAMINATION SYSTEM FOR THE DECONTAMINATION OF EXPLOSIVES-CONTAMINATED DEBRIS & PIPING

VALIDATION TEST REPORT

VOLUME III
Appendices E-L

WESTON
MANAGERS DESIGNERS/CONSULTANTS

96P-3256

VALIDATION TEST REPORT
FOR THE
TRANSPORTABLE HOT-GAS DECONTAMINATION SYSTEM
USED TO SUPPORT THE DECONTAMINATION OF
EXPLOSIVES-CONTAMINATED PIPING AND DEBRIS

VOLUME III: APPENDICES E-L

Contract No. DACA 31-91-D-0079
Task Order 12

Prepared for

U.S. ARMY ENVIRONMENTAL CENTER (USAEC)
SFIM-AEC-ETD
Edgewood Area
Aberdeen Proving Ground, MD 21010-5401

September 1996

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APPENDIX E

CONTROL ROOM LOGS FOR FURNACE RUNS 1-18

VALEDATION TEST #1

12HR SOAK

Soak Period		Total Soak Time	Soak Time Remaining	Soak Completion Time	
0132 - 0554	4:22	4:22	7:38		
0700 - 0847	1:47	6:09	5:51		
0908 + 551				1459	2:59PM

Validation Test #1

Control Room Log

31 January ~~19~~ 1996

1634 Light Burner to furnace

1753 Shutdown of AB. (High temp) ?

1755 A-Burn on

~~0~~1822 ~~E~~ reached 200°F, 70% on ~~A~~ furnace damper
Started ramp @ 50°F/hr

1832 1832 Inlet ~~em~~ gas sample started

1834 18 34 Stack samples started

0006 Bleed Air Damper on furnace reset at ~~60~~ 65% open

0110 - Approximate end for explosives trains @ stack and inter-connecting duct.

- Remaining tests will end between 0110 and approx 0130

0126 - Hex Chrome train completed. - All emissions testing completed except mid-soak period explosives train.

0132 500°F Soak Time Started; Soak for 12 hrs
Expected end of Soak 1:30pm.

0323 Reduce Bleed Air Damper from 50% to 45%

0315 Changed PID constants in TIC-131 to reduce cycling in Afterburner, Data will show ~~a~~ cycling reduced in NO_x, O_2, CO_2 also.

0353 Switched TE-203 & TE-204 at 3:53:14 to check accuracy of transmitters checked reading 3:53:44 and then switched them back. Transmitters had same readings showing good calibrations.

0420 Increased Bleed Air Damper from 45% to 50%

0520 Increased Bleed Damper to 60%

VALEDATION TEST#1

CONTROL ROOM LOG

0538 Reduced Bleed Air to 50%

0554 BURNERS TRIP OFF Lost Draft Soak Time ~~4~~ hr ~~33~~ 22 min

0556 AFTER BURNER RE LIT

0610 LIT FURNACE

0638 Furnace Temp back to 500° Avg Temp 447°

0644 Start Inlet sampling Cntrl Temp 526°, Avg 469°

0656 Avg Temp 499°

0700 Avg Temp 500° Re-start soak time, Soak Time Left ~~8~~ 7 hr ~~32~~ 38 min

Expected End of soak time ~~1532~~ 1438

0847 Lost Burners High Temp in A-Burner Stop sampling, stop soak time

852 A-Burner relit

856 Furnace relit

901 Furnace Temp back to 500°

908 Avg Temp 500°

910 Restart sampling

1005 End inlet sampling

1348 End Soak period begin ramping down furnace temp

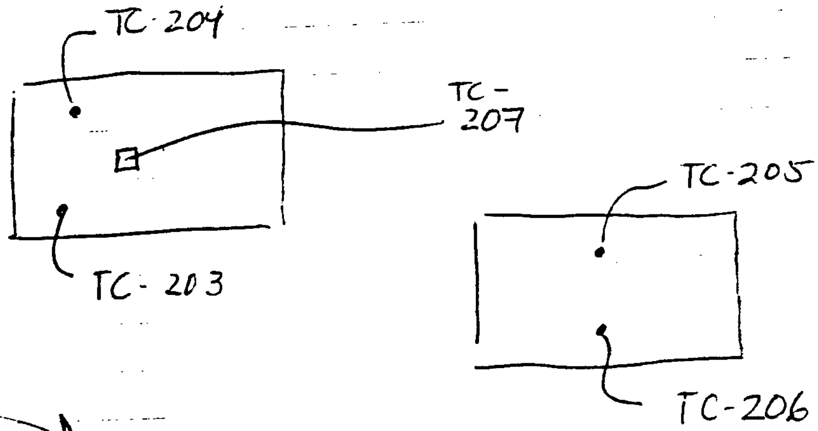
1354 Shut Furnace Burner off

1430 Shut down Afterburner

1630 OPEN FURNACE DOOR / TAG-OUT BURNERS

** NOx Analyzer was working irregularly during test. Post test investigation indicated clog in sample line. NOx readings through 1st test ~~was~~ could possibly ~~still~~ be incorrect and should not be relied on!

VALEDATION #2
Feb 2, 96



10:35 Roll call complete begin start-up procedure
11:06 Start logger
11:08 Start A-Burner Heat-up
11:28 A-Burner 1750°
11:30 Light Furnace Begin Heat-Up
1300 Furnace Temp 250° Begin 50°/Hr Ramp

1337 Jim unplugged TC 205 to verify functionality and/or presence of a fray or short, etc.
1338 TC-205 plugged back; no sign of fray or tear in TC line.
1339 TC-205 unplugged; checking ~~transmitter~~
1348 TC-205 plugged back in.
still reading low
1405 Start Air sampling

VALEDATION TEST #2

2 FEB

1600 At approx. 1600 or before Furnace draft pressure was indicating positive pressure. Duct pressure at that time was -.70 and there fore the furnace was not shut off. Icing had developed on the low side of the draft transmitter giving a false indication of positive pressure. After clearing the ice plug, the furnace draft reading came back to negative

1700 Begin 6 Hr Soak period
Expected End of Soak 2300

1710 Begin lowering Furnace setpoint from 450° but maintaining Average material temp at 400°

1724 Begin closing bleed air damper

2038 End Stack sampling

2100 END INLET SAMPLING

2300 End 6 hr Soak period begin ramping down & Cooling Furnace

2304 Shut Furnace burner off

2321 Shut After burner off, Furnace Temp 199°

~~2352~~ Continue cooling Furnace

2352 Shut ID Fan off, Furn. Temp 84°

2352 Turned Logger off

From Start of Furnace to End of Soak Period
11:30 furnace - 2300 ⇒ 690 min
11 hr 30 min

2/3/94

1010 START AFTERBURNER TO WARM-UP THE SYSTEM SO WE CAN OPEN THE DOOR DUE TO THE ICE

10:15 AFTERBURNER = 600°F

START FURNACE BURNER.

12:00 Started Post-Test Sampling for Validation Test #2.
16°F outside; lite snow

Jeff O'Neill & Jack Mills working in Stack Team Trailer

1:00 Jeff & Jack planning on being back here tomorrow @ 7:00am

1:30 Vu & Matt done post test sampling.

3:00 Vu & Matt spiking for Test #3.
furnace test plates will be spiked w/ Tetryl.

5:30 Vu & Matt ~~done~~ completed spiking for test #3

VALEDATION TEST #3

4 FEB 96 50°/Hr Ramp, 500° 4 hr Soak

0728 Start Afterburner
0812 start Furnace
Difficulties lighting furnace with cold weather
831 Furnace burner stayed lit

1000 Holding temp at 250° while taking care of icing problems with cooling water for probes
1300 Begin 50°/Hr heat-up
1406 Start Air sampling on stack and furnace, Furnace temp 300°

1854 Begin 4 hr soak Avg Temp 500°

2048 Complete Stack sampling

2106 Complete Furnace sampling
2254 End Soak Period begin shutting furnace down
2305 Shut Furnace off, begin cooling
2323 Shut Afterburner off, continue cooling
23 Shut ID Fan off & Logger

From Start of furnace to End of Soak Period
0812 - 2254 => 822 min
13.7 hr or
13 hr 42 min

VALIDATION TEST #4

6 FEB, 96

18:50 START COMPUTER LOGGER
18:55 CALIBRATING CEM
21:30 LIT AFTERBURNER
PROBLEM WITH FURNACE THC ANALYZER

VALEDATION TEST # 4

7 FEB. 96

02:17 LIT FURNACE BURNER
PROGRAM CONTROL PROGRAMMED FOR 250°F
IN 1 hr.

0800 Start of Soak Cycle.

~~12~~
1420 End Soak cycle.
Adjust furnace setpoint to 200°F

1500 Turn ~~a furnace~~ furnace burner
off.

1545 Turn-off Afterburner.

VALEDATION TEST # 5

22:45 FURNACE LOADED
CALIBRATING CEM
23:00 LIT SCC BURNER
23:22 LIT FURNACE BURNER
30 MIN TO 300°F
4 hr 40 min. To 650°F (75°/hr)
4 hr SOAK AT 650°
5 min TO 0° SETPOINT

8 FEB. 96

0405 START SOAK CYCLE
0810 STOP SOAK START COOL DOWN
1030 CUT FURNACE BURNER OFF
1034 CUT AFTER BURNER OFF
1037 Datalogger off.

VALIDATION TEST #6

12 FEB 96

0757 START LOGGER
0802 LIT SCC BURNER
09:57 LIT FURNACE BURNER
TEST #6, 75°F hr RAMP, 600°F 2hr
SOAK TIME RANGE
10:06 CHANGED ~~SCALE~~ ON CHART RECORDER
FROM 600°F TO 700°F RANGE
10:45 THERMOCOUPLE TIT 205 MALFUNCTIONING
JIM H. INVESTIGATING
10:54 REPAIRED SHORT IN THERMOCOUPLE TIT
205 PLUG
14:50 AVG. FURNACE TEMP. 600°F, STARTING
2 hr. soak CYCLE
1650 2 hr SOAK CYCLE COMPLETE, START
COOL DOWN
1740 CUT AFTERBURNER OFF
1743 SHUT DATALOGGER OFF

VALIDATION TEST # 7

13 FEB, 96

16:15 START AFTERBURNER HEAT-UP
16:20 START FURNACE CHART RECORDER
16:26 LIT FURNACE BURNER, 100°F PER hr.
RAMP-UP, 600°F 1 hr SOAK
16:37 TIT-145 Range was changed from
0-1850°F to 0-2000°F. Logger is
still looking at 0-1850° range.
Correction for logged data will
be (logged number ÷ 1850) x 2000
Hand written log will be logged
off of TIS-145 controller
17:35 FURNACE BURNER OFF 1 MIN. DUE TO
AFTERBURNER TEMP. going BELOW 1750°F
2113 START 600° SOAK FOR 1 HOUR
2218 STOP SOAK : START COOL DOWN
0019 TURN FURNACE BURNER OFF
0043 TURN AFTERBURNER OFF
0045 SHUT DATA LOGGER OFF

Validation Test #8

15 Feb 96

0430 Matt & Kevin start loading and spiking at the furnace.

1005 Done Spiking furnace.

1205 LIT AFTERBURNER
1228 START FURNACE CHART RECORDER
1230 START FURNACE BURNER, START VALIDATION TEST #8, 100°F PER hr RAMP UP, 500°F 2 hr SOAK
16:15 FURNACE AVG. TEMP. 500°F, STARTING 2 hr. SOAK CYCLE
18:15 2 hr SOAK CYCLE COMPLETE, STARTING FURNACE COOL DOWN
18:18 SHUT OFF FURNACE BURNER
18:54 FURNACE TEMP BELOW 200°F, SHUT OF AFTERBURNER
2025 SHUT LOGGER OFF

Validation Test #9

04:00 Spike System, Unused TNT crystal from Test #1 were added with extra acetone

05:15 Done Spiking

19FEB96 TEST #9 100°F AN HOUR TO 600°F IMMEDIATE CUTOFF

1200 START AFTERBURNER
1250 START FURNACE
1250 START CHART
1700 ~~FURNACE~~ 22K AFTERBURNER TRIP OFF HIGH TEMP
1707 RELIT AFTER BURNER
1713 RELIT FURNACE
1731 RESTARTED RAMP
1908 FURNACE Avg. Temp. 600°F, STARTING FURNACE Cooldown
1918 Shut OFF FURNACE BURNER, WENT TO 100% ON BLEED AIR DAMPER
20:03 FURNACE Temp. 193°F, Shut off AFTERBURNER, ID FAN DAMPER 90%
2045 Stopped Computer DATA Logger

VALIDATION TEST # 10

20 FEB. 96
150°F hr RAMP UP
550°F SOAK TEMP.
1 hr SOAK TIME

1847 START DATA LOGGER
1849 LIT AFTERBURNER
1900 JIM H. CALIBRATING CEM
19:49 START CHART RECORDER
19:52 LIT FURNACE BURNER, STARTED RAMP UP
23:38 FURNACE AVG. TEMP. 550°F, STARTING 1hr.
~~23:3~~ SOAK

21 FEB 96
0038 1 hr SOAK CYCLE COMPLETE, STARTING FURNACE COOL DOWN
0120 FURNACE TEMP. 193°F, STOPPED AFTERBURNER
0132 STOPPED COMPUTER DATA LOGGER
0547 START COMPUTER DATA LOGGER TO UPDATE THERMOCOUPLE TEMPS. ; STOP DATA LOGGER

TEST #11
22 FEB 96
150° hr RAMP
400° SOAK FOR 1 hour

1000 START AFTER BURNER
1000 START DATA LOGGER
1001 START CHART RECORDER
1047 START FURNACE
1228 START SOAK 1 HOUR AT 400°
1328 1 HOUR SOAK TIME COMPLETE
START FURNACE COOL DOWN
1430 SHUT AFTERBURNER.

VALIDATION TEST #12

26 FEB. 96

11:50 LIT AFTERBURNER

12:36 START DATA LOGGER, CHART RECORDER

12:50 LIT FURNACE BURNER

START 200°F hr RAMP-UP, 300°F SOAK TEMP, 1hr. SOAK TIME

TT-100 Thermocouple was moved (prior to starting the test) to measure the Furnace Exit Gas Temp within the interconnect duct approx. 10" from the furnace shell. A Type K TC was used and the ADAM module was reprogrammed and calibrated. Jim H.

14:58 START 1hr. 300°F SOAK CYCLE

~~13:58~~

1558 COMPLETE 1HR SOAK START FURNACE COOL DOWN

1600 SHUT OFF FURNACE

Shut-Down Afterburners.

1840 SHUT CHART RECORDER OFF

SHUT DOWN AFTER BURNER

TEST # 13

27 FEB. 96

08:06 START DATA LOGGER, LITE AFTERBURNER 200°F / hr. RAMP UP, 500°F SOAK TEMP, 1 hr. SOAK CYCLE

08:39 START CHART RECORDER, LITE FURNACE BURNER

1051 FURNACE AVG. TEMP. 500°F, START 1 hr. SOAK CYCLE

1053 AFTERBURNER CONTROLLER THERMOCOUPLE TEMP. READING MALFUNCTIONING, SWITCHED CONTROLLER FROM AUTO TO MANUL

1153 1 hr. SOAK CYCLE COMPLETE, LOWERING FURNACE TEMP.

11:58 LOST AFTERBURNER ~~TEMP.~~ BURNER DUE TO high TEMP. RELIT AFTERBURNER BURNER

13 15 SHUT DOWN AFTERBURNER

1500 SHUT AFTERBURNER FAN OFF

TEST # 14

28 FEB 96

11:35 START DATA LOGGER, CHART RECORDER
11:40 LIT FURNACE BURNER.
11:41 WENT TO AUTO - RUN ON FURNACE TEMP. CONTROLLER
300°F hr RAMP, 600°F SOAK TIME, 1 hr SOAK CYCLE
1335 LOST FURNACE BURNER due TO high TEMP. (TEMP SPIKE)
1337 LOST AFTERBURNER BURNER, LOW AFTERBURNER PRESSURE DUE TO FURNACE BURNER LITING
13 39 LOST FURNACE BURNER, high TEMP. SPIKE
13 48 LOST FURNACE BURNER, High TEMP. SPIKE
14 05 LOST FURNACE BURNER due TO high TEMP. SPIKE
14:19 FURNACE AVG. TEMP. 600°F, STARTING 1 hr. SOAK CYCLE.
15:19 1 hr SOAK COMPLETE
15:25 SHUT FURNACE BURNER OFF
16:16 SHUT OFF OXIDIZER
1717 STOP CHART RECORDER

TEST # 15

1 MARCH 96

0805 LIT OXIDIZER
0839 START DATA LOGGER
08:44 START CHART RECORDER
08:46 LIT FURNACE BURNER
08:47 START RAMP-UP 300°F hr, 600°F
SOAK, 1 hr SOAK CYCLE

Control, Record, & Hi-Limit TCs were moved prior to start-up to avoid local high temp. readings on Hi-Limit when explosive spike material flashes.

Location before — Location AFTER

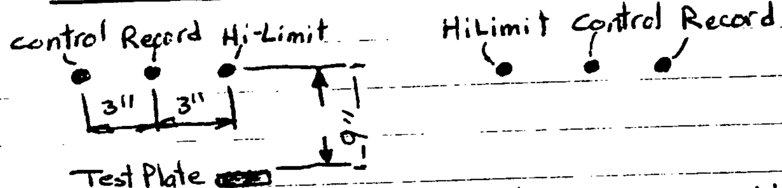


Chart recorder may indicate temp. spike if explosive material flashes

1037 LOST FURNACE BURNER DUE TO high TEMP SPIKE, RELIT BURNER
1039 LOST FURNACE BURNER DUE TO high TEMP. SPIKE, RELIT BURNER
1052 FURNACE AVG. TEMP 600°F, START 1 hr SOAK CYCLE
11:52 1 hr SOAK COMPLETE, STARTING FURNACE COOL DOWN
12:38 FURNACE TEMP. BELOW 200°F, STOPPED AFTER BURNER
13:16 STOPPED DATA LOGGER

TEST #16A   6 MARCH 96

Changes made prior to starting Test.

1. Furnace control thermocouple TE-202 was moved from the furnace chamber and inserted into the furnace exit duct in order to measure and control based on exit gas temp.
2. Thermocouple TE-100 which was measuring furnace exit gas temp, was moved to measure ID Fan Inlet Gas Temp.
3. Stack NOx analyzer was moved to the Interconnect Duct sample line and was set-up to measure NO instead of NOx.
4. Internal bleed air duct was rotated 180° back to its original position.

1507 START AFTER BURNER
TEST #16 TNT SPIKE ONLY
600°F
300°F / HR RAMP NO SOAK TIME
1514 LOGGER ON
1520 START CHART RECORDER
1531 STARTED FURNACE
1532 Start ramp at 100°
1710 Material temp avg. 600°
1720 Shut-off Furnace
1747 Shut-off Afterburner
1800 Shut-off Logger

TEST 16B

6 MAR. 96

2204 START DATA LOGGER
2206 START OXIDIZER
2230 LIT FURNACE BURNER; START CHART RECORDE.
2231 START 300°F hr. RAMP-UP TO 600°F
NO SOAK TIME
2351 FURNACE AVG. TEMP 601°F, SWITCHE.
FURNACE CONTROLLER FROM AUTO TO
MANUAL, START LOWERING FURNACE
TEMP.
2354 STOPPED FURNACE BURNER
3030 STOPPED ~~OXI~~ OXIDIZER BURNER,
STOPPED DATA LOGGER

TEST 16C

7 MARCH 96

1305 Start Datalogger
1306 Start Afterburner
1321 Start Furnace
1325 Start Furnace Ramp @ 100°
1453 Avg temp 600° ~~Begin cooling down~~
1500 Begin cooling down
1502 STOPPED FURNACE BURNER
1538 STOPPED AFTERBURNER, STOPPED DATA LOGGER

TEST 16D

1947 START DATA LOGGER
1955 START AFTERBURNER
2001 START CHART RECORDER
2008 LIT FURNACE
2012 START FURNACE RAMP @ 100°F
2141 AVG. TEMP. 600°F
2142 START FURNACE COOL DOWN
2231 STOPPED AFTERBURNER
2132 STOPPED DATALOGGER

TEST#17A
8 MARCH 96

1052 Started Logger
1056 Lit Afterburner
1111 Lit Furnace
1119 Started Ramp (300°/Hr) at 100°
1244 Avg material Temp 600°, begin soak
1445 COMPLETED 2 HR SOAK START COOL DOWN
1540 STOPPED AFTERBURNER
1544 STOPPED DATALOGGER

TEST 17B

1930 START DATALOGGER
1931 START AFTERBURNER
1947 START CHART RECORDER
1949 LITE FURNACE
1953 FURNACE TEMP. 100°F, START 300°F/hr RAMP
2120 FURNACE AVG. TEMP. 600°F, START 1hr SOAK CYCLE
2220 1hr SOAK COMPLETE, START FURNACE COOL DOWN
2240 STOPPED AFTERBURNER
~~STOPPED~~

TEST 17 C

11 MAR. 96

0827 START DATALOGGER + AFTERBURNER
0846 START CHART RECORDER
0854 LIT FURNACE
0904 START 330°F/hr RAMP
1028 MATERIAL AVG. TEMP. 602°F, START 2 hr. SOAK CYCLE
1228 2 hr. SOAK CYCLE COMPLETE, START FURNACE COOLDOWN
FURNACE TEMP 195°F, STOP AFTERBU
STOP DATALOGGER

TEST 18 HOT DECON

1454 Lit Afterburner
1513 Lit Furnace
1514 Start Ramp (550°/Hr) at 100°
1621 ALL FURNACE TEMP. READINGS ABOVE 600°F START 2 hr SOAK CYCLE
1821 2 hr SOAK CYCLE COMPLETE, START FURNACE COOLDOWN

APPENDIX F

HOURLY DATALOGS FOR FURNACE RUNS 1-18

Pre - START-UP (1 of 3)

Date:	1-31-96 J.T.	**Test Number:**	#1 J.T.
Time:	1026 J.T.	**Ramp-Up Time**	50°F / Hr
		Soak Time:	12 Hrs
		Soak Temp:	500° F

MECHANICAL

Initial each item.

- [x] **Inspection doors/manways are SECURED** JT
- [x] **Gas Valves OPEN** JT
- [x] **View/Inspection Ports CLOSED** JT

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

* Record Gas (Propane) Valve 85%

ELECTRICAL

Initialize each item.

- [x] **All Lockout/Tagouts (1-5) are ACCOUNTED for.** JT
- [x] **Furnace and Afterburner Control Breakers are ON.** JT
- [x] **Verify Emergency Stop Pushbuttons are NOT ENGAGED** JT
- [x] **BUMP Motors and switch to AUTO** JT
  - JT *Furnace Combustion Blower (M-220)*
  - JT *Afterburner Combustion Blower (M-130)*
  - JT *Afterburner I.D Fan (M-158)*

Verify field selector switches are in "AUTO" after all motor have been "BUMPED" to verify operations.

* Place Afterburner Switch in ~~Auto~~ Remote

- [ ] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
____ *Interconnecting Duct NOX*			
____ *Interconnecting Duct THC*			
____ *Stack's NOX*			
____ *Stack's SO2*			
____ *Stack's THC*			
____ *Stack's CO*			
____ *Stack's O2*			
____ *Stack's CO*			

** *Verify that all regulators on Calibration Gas Tanks are* ***CLOSED***

- [x] **Datalogger/Computer is ON** JT

13:42 *Record Time (Computer Clock)*

36°F *Record Ambient Air Temperature (TIT-300)* 664-

81% *Ambient Humidity (call weather service @ 205-668-3010)* 9:

@13:06 *record every 6 hours on data log sheet* 945-7000 ANS Mach

Complete

* Lock-out All Motors; Exclusion Log'

* Spiking

→ Secure Equipment Pad and Access Road w/ chain

Test Number: H1 N.T.
Ramp-Up Rate:
Soak Time:
Soak Temp:

LOADING/UNLOADING (2 of 3)

Date: 1-31-96 N.T.
Time: 1026 N.T.

FIELD ACTIVITIES

Initial each item.

[N] **Load Furnace with Materials and Thermocouples**

For each rack/bin, provide a description in terms of contents, appearance, moisture, etc.
*** Refer to loading procedures for instructions.*

#A Rack A's Characteristics. Cinder Blocks = 632 lbs.

Initial Wt.(lbs)	Final Wt.(lbs)	Test Materials		Initial Wt.(lbs)	Final Wt.(lbs)
—	—	~~Cinder~~ SD			
1162 #		SD	SD		

Take Pictures — Unable to photograph camera malfunction CH

** ~~Verify pipe is chocked with wooden chucks prior to loading~~ secure w/ to prevent pipes from rolling into each other.

B Rack B's Characteristics. Steel pipe & clay pipe = 483 lbs

Total Weight = 1158 #

Rack + Steel = 974 #

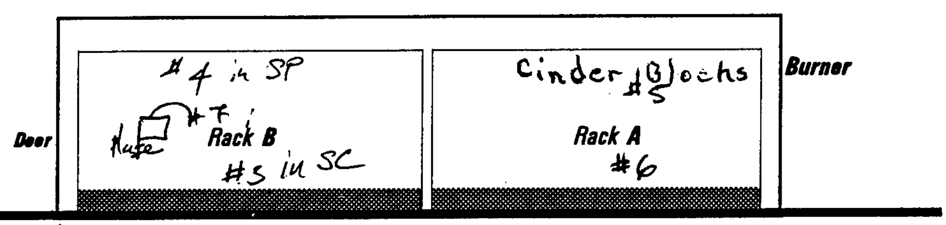
Rack = 483 lbs.

Initial Wt.(lbs)	Final Wt.(lbs)	Test Materials		Initial Wt.(lbs)	Final Wt.(lbs)
491		SP	SP		
184 lbs		SC	SC		
4 Included		Clean Pipe ~~SP~~	Clean Pipe ~~SP~~		

Take Pictures — See Note above CH

** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.
** **No more than 1-lb of total explosives will be loaded into the furnace during any one batch/load.**

[Y] N **Mark Locations of Thermocouples**



[ ] **Roll Calls and Close Furnace Door (Signatures required)**

Verify all site personnel are accounted.
Have each person initialized this checklist.
Close and secure furnace door.

[ ] ~~Secure Equipment Pad and Access Road with Chain Links~~

*Complete Spike Sample Weigh Sheet

** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE

START-UP (3 of 3)	***Test Number:*** 1
Date: 31 JAN 96	***Ramp-Up Time:*** 50°/Hr
Time: 14:17	***Soak Time:*** 12 Hours
	Soak Temp: 500°

AFTERBURNER START-UP

Initial and record time for each item.

[LH] **Start "I.D. Fan". Adjust fan speed to maintain a system draft < -0.5 In. WC**

[LH] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**

[LH] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

[LH] **Start "DATALOGGER" Pushbuttons on the Computer.**

[LH] **Heat-Up Burner to 1800 Deg. F. Adjust I.D. Fan speed to maintain <-0.5 In.WC**

@ 600 F: ________ ***:Time***
@ 1200 F: ________ ***:Time***
@ 1800F: ________ ***:Time***

Once the burner is operating at low fire, the control will be released to the
The operator must adjust gas flow and I.D. fan speed to maintain temperat
and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

[X] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC** ← set Bleed air damper to 75% ← set Controller to Manual set output to 0.0

K34 Light off [LH] **Verify for "INTERLOCK OK" Light is energized. Turn Furnace Key to "BURNER" Position.**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner in low fire. ← open Bleed air valve to 100%

[LH] **Ramp-Up Furnace Temperataure to SOAK Temperature. Maintain Ramp-Up Rate. Adjust ID Fan .... and Temperat**
**** Record furnace temperatures during ramp-up on hourly datalog sheet**

Once the burner is operating at low fire, the burner control will be released to the operator. The opera
ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK te

[GAP] **Manually Log Operating Parameters.**

Use the attached "WARM UP, SOAK, and COOL-DOWN" log sheet to record all operating parameter
30 Minutes intervals. SOAK times and temperatures may vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initialize and record time for each item.

[GAP] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**

[GAP] 2/1/96 **STOP "OXIDIZER" and "AIR BLOWER"**

[GAP] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

Date: 21 JAN 96
Time:

Test Number: T-1
Ramp-Up Rate: 50°/hr
Soak Time: 12 Hours
Soak Temp: 500 °F

Missed 10:00pm reading

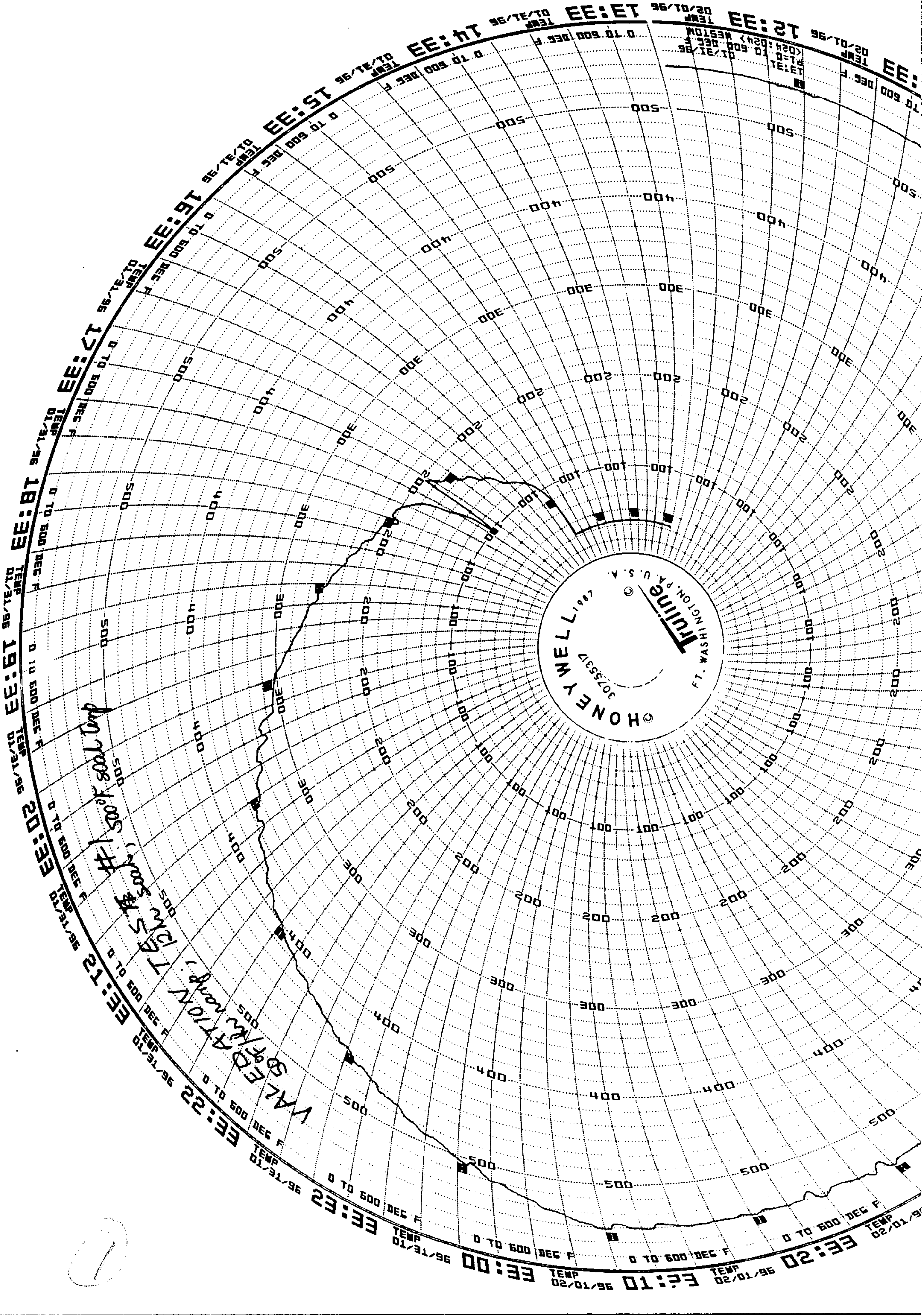
Tag	Description	Unit		1334	1400	1500	1600	1700	1800	1900	2000	2100	2300 2200	~~2300~~	0	100	200	300	4
Time:																			
FURNACE																			
PIT-232	Fuel Gas Pressure	In.WC			-.16	-.14	-.10	11.24	-.06	20.92	24.27	33.43	36.95		41.26	40.95	37.89	38.93	3
FIT-231	Fuel Gas Flow	CFH	Actual		200	200	201	183	200	175	173	170	169		167	167	168	168	/
PIT-222	Combustion Air Pressure	In.WC			23.75	23.64	23.78	24.69	23.84	25.04	25.23	25.46	25.45		25.49	25.42	25.36	25.37	2
FIT-221	Combustion Air Flow	CFH			731	723	734	1516	742	1845	1952	2123	2164		2195	2192	2142	2155	2
PIT-188	Chamber Pressure	In.WC			-.32	-.32	-.31	-0.29	-.31	-0.33	-0.32	-0.30	-0.29		-0.29	-0.34	-.48	-.48	-
TIT-201	Recorder Temperature	Deg.F			38	38	37	122	105	223	268	373	422		473	524	550	544	5
✓ TIT-202	Furnace Exit Gas Temp (Control)	Deg.F		37	38	37	37	124	102	225	271	376	426		477	527	546	545	5
TIT-203	Material Thermocouple #1	Deg.F			37	38	37	87	136	185	225	318	368		413	479	518	516	5
TIT-204	Material Thermocouple #2	Deg.F			35	35	35	85	84	158	195	277	316		358	407	454	466	4
TIT-205	Material Thermocouple #3	Deg.F			37	37	36	97	91	168	218	309	350		398	453	494	504	5
TIT-206	Material Thermocouple #4	Deg.F			38	37	37	97	137	203	251	350	401		450	498	529	527	5
FIT-207	Material Thermocouple #5	Deg.F			38	37	37	110	95	201	245	347	396		442	504	530	527	5
		Avg															504	507	5
AFTERBURNER																			
✓ TIT-131	Combustor Burner Temp. Control	Deg. F		1400	1753	1777	1782	1834	1817	1808	1812	1809	1815		1820	1807	1819	1797	/
FIT-140	Fumes Flow	pph ~~CFM~~		2353	.53	2259	2230	2296	420	—	/	~~404~~	~~398~~		~~407~~	—	—	—	-
PIT-151	Fumes Pressure (Furnace Draft)	InWC		.55	.53	.53	.53	0.60	0.60	0.64	0.67	0.67	0.70		0.73	0.43	.38	.39	.2
TIT-165	Combustor Temperature	Deg. F		1457	1746	1814	1815	1838	1817	1813	1815	1818	1803		1818	1812	1807	1800	/8
PIT-133	Fuel Pressure	PSIG		.84	.84	.80	.81	0.77	.84	0.68	0.66	0.56	0.60		0.40	0.13	.11	.16	.
TIT-121	Fuel Gas Flow	CFH ~~CFM~~		1103	1102	1073	1070	1037	1101	946	918	855	872		750	590	596	606	5
CEM																			
NOx-B	Range 0-1000 Interconnecting Duct NOx	ppm			0.0	0.0	707.9	0.6	0.7	0.8	0.9	0.9	0.9		0.7	0.8	.9	1.0	.
THC-B	Interconnecting Duct THC	ppm			10.0	-.4	-2.0	26.6	1.1	16.9	15.4	11.4	8.1		8.0	10.3	11.4	8.2	7
CO	Stack's CO	ppm			-.5	-.5	0	0	-0.5	0.5	-0.5	-0.5	-0.5		-0.5	-0.5	-.5	-.5	-
THC	Stack's THC	ppm			.6	.3	0	0.7	0.7	0.8	1.0	0.7	0.6		0.5	0.6	.8	1.0	.
NOx	Stack's NOx	ppm			0.0	0.0	201.5	41.6	44.8	41.4	40.4	5.5	48.6		46.0	48.6	52.7	56.2	6
SO2	Stack SO2	ppm			-2.0	7.5	401	0	-2.0	-1.5	-1.5	-1.0	-1.5		-2.5	-2.5	-2.0	-1.0	-
O2	Stack's O2	%			12.6	10.28	.05	12.35	12.05	12.22	12.27	11.88	11.70		12.13	11.63	11.4	11.32	12
CO2	Stack's CO2	%			.10	.10	0	5.66	5.78	5.60	5.62	5.54	5.9		5.70	5.98	5.72	6.16	5
TIT-300	Ambient Temp	Deg. F			54	35	34	32	32	32	32	32	35		32	32	32	32	3
Weather Service	Relative Humidity				81%								84		—				

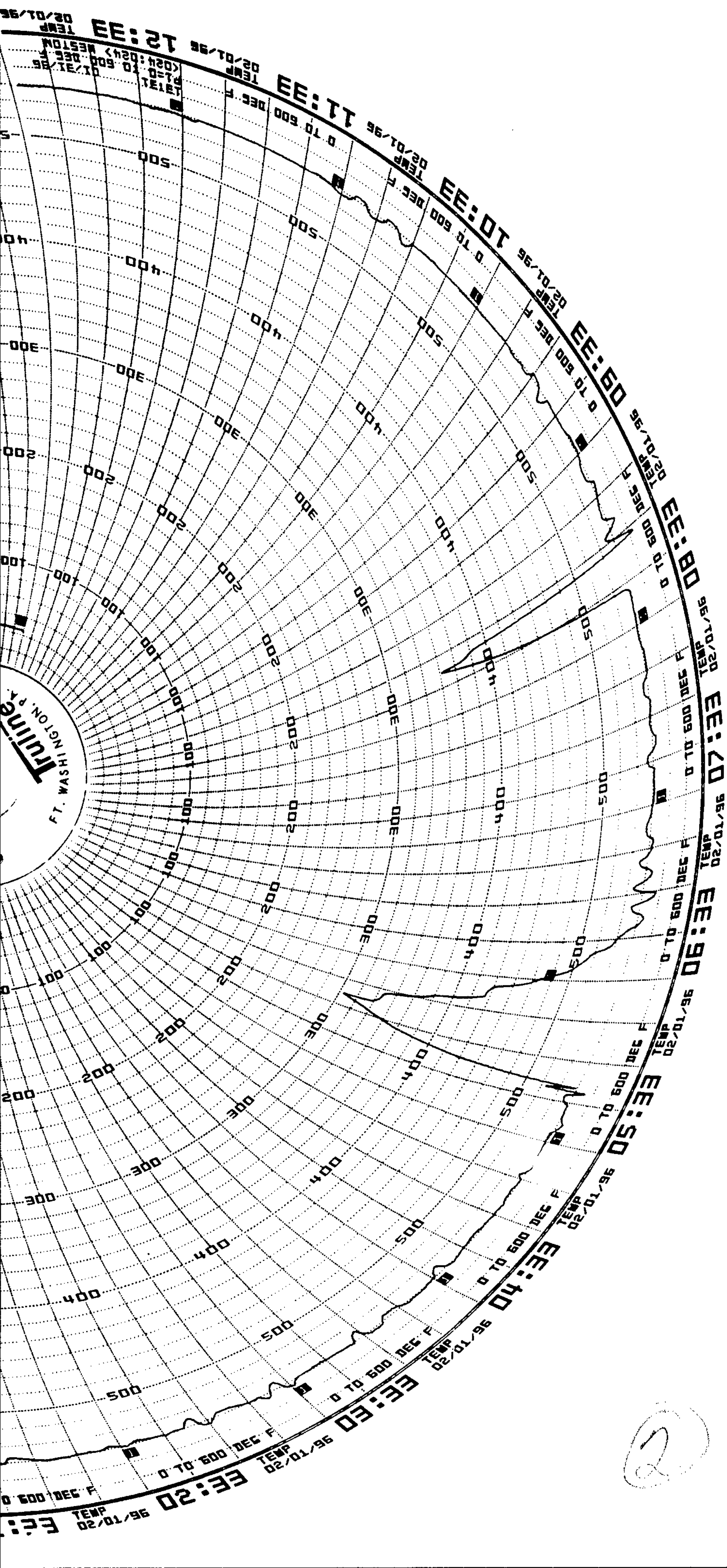
Missed 10:00pm reading

2300 / 2200	~~2300~~	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1410 / 1400	1500
36.95		41.26	40.95	37.89	38.93	31.22	34.73	-0.13	45.12	35.74	38.78	36.19	34.84	34.73	34.51	-.20	-0.19
169		1.67	1.67	168	168	170	169	201	166	169	168	168	168	168	168	20	202
25.45		25.49	25.42	25.36	25.37	25.27	25.23	23.68	25.29	25.22	25.26	25.23	25.04	25.00	25.01	23.42	23.25
2164		2195	2192	2142	2155	2066	2097	659	2186	2111	2300	2120	2088	2088	2075	688	561
-0.29		-0.29	-0.34	-.48	-.48	-.48	-.52	-0.72	-.48	-.46	-.50	-.45	-.46	-.46	-.45	-.51	-1.00
422		473	524	550	~~544~~	549	549	314	555	548	465	552	549	549	549	231	101
426		477	527	546	545	553	551	312	545	551	536	554	553	552	552	230	99
368		413	479	518	516	523	522	428	501	518	489	524	520	522	521	336	125
316		358	407	454	466	475	479	369	459	471	479	480	485	490	492	323	211
350		398	453	494	504	518	517	358	491	510	498	513	517	516	517	295	163
401		450	498	529	527	531	530	388	511	529	463	529	530	531	530	299	119
396		442	504	530	527	534	533	297	531	530	552	537	533	534	535	225	99
				504	507	517	516		501	512	500	516	516	518	519		136
1815		1820	1807	1819	1797	1795	1797	1770	1793	1793	1787	1807	1795	1789	1801	1752	243
~~398~~		~~407~~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.70		0.73	0.43	.38	.39	.27	.33	0.67	.39	.37	.36	.35	.35	.36	.36	1.37	2.44
1803		1818	1812	1807	1800	1802	1808	1796	1807	1797	1778	1816	1794	1809	1820	1757	208
0.60		0.40	0.13	.11	.16	.11	.11	0.58	.10	.14	.15	.14	.07	.07	.07	.85	.01
372		750	590	596	606	592	533	766	506	486	599	598	471	462	461	1097	1
0.9		0.7	0.8	.9	1.0	.9	.9	.9	.9	1.0	1.0	1.0	.9	.8	.8	.6	.6
8.1		8.0	10.3	11.4	8.2	7.3	8.6	-2.4	-2.4	-2.3	-2.8	-1.8	-1.8	-2.2	-2.3	-1.6	1.4
-0.5		-0.5	-0.5	-.5	-.5	-.5	-.5	-0.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	.5
0.6		0.5	0.6	.8	1.0	.9	.8	0.9	.9	.9	1.0	1.0	.9	.8	.8	1.0	.4
48.6		46.0	48.6	52.7	56.2	60.5	56.4	49.8	51.0	61.5	50.6	61.9	48.0	47.1	47.7	39.3	-1.0
-1.5		-2.5	-2.5	-2.0	-1.0	-1.0	-1.5	-2.5	-3.0	-2.5	-2.5	-3.0	-3.0	-3.0	-3.5	-5.6	-6.5
11.70		12.13	11.63	11.4	11.32	12.05	11.82	13.80	11.6	11.35	11.68	11.36	11.95	12.9	12.52	13.82	21.30
5.94		5.70	5.98	5.72	6.16	5.68	5.88	4.58	5.92	6.14	5.48	6.20	5.94	5.2	5.22	4.82	.02
35		32	32	32	32	32	33	33	33	34	36	36	38	38	38		37
84		—											75%				

00	1300	1410 1400	1500
.73	3451	-.20	-0.19
8	168	20	202
00	2501	2342	23.25
88	2075	688	561
6	-.45	-.51	-1.00
9	549	231	101
52	552	230	99
2	521	336	125
0	492	323	211
6	517	295	163
31	530	299	119
34	535	225	99
18	519		136
89	1801	1752	243
–	–	–	–
6	.36	1.37	2.44
09	1820	1757	208
7	.07	.85	.01
62	461	1097	1
8	.8	.6	.6
.2	-2.3	-1.6	1.4
5	-.5	-.5	.5
8	.8	1.0	.4
7.1	47.7	39.3	-1.0
.0	-3.5	-5.6	-6.5
.9	12.52	13.82	21.30
.2	5.22	4.82	.02
8	38		37

3

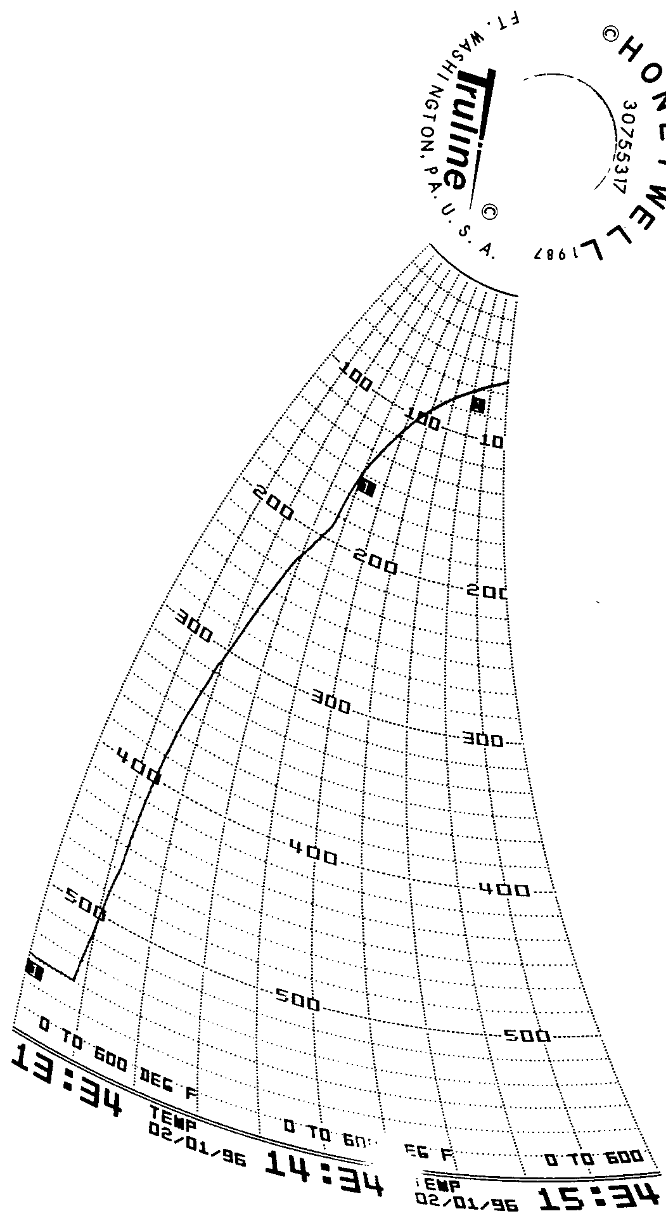

VALEDATION TEST #1 500°F soak Temp
soft ramp; 12 hr soak;
HONEYWELL 1987
Truline
FT. WASHINGTON, PA. U.S.A.
30755317
0 TO 600 DEC F
TEMP 01/31/96 23:33
TEMP 01/31/96 00:33
TEMP 02/01/96 01:33
TEMP 02/01/96 02:33


FT. WASHINGTON, PA.
TEMP
02/01/96
0 TO 600 DEG F
02:33
03:33
04:33
05:33
06:33
07:33
08:33
09:33
10:33
11:33
12:33

(2)

Validation Test #1
2/1/96
50°F/hr ramp
12 hr soak
500°F soak temp

13:32
P1:10 02/01/96
0 TO 600 DEG F
<024:024> WESTON



NO_x Cal Sheet
Post Test #1 - Pre Test #2
2/1/96

Pre - START-UP (1 of 3)

Date: Feb 2 1996
Time: Started 11:00 am ^ afterburner

Test Number: 2
Ramp-Up Time 50°F/hr after 200°F
Soak Time: 6 hrs
Soak Temp: 400°F

MECHANICAL

Initial each item.

- [GH] **Inspection doors/manways are SECURED**
- [GH] **Gas Valves OPEN**
- [GH] **View/Inspection Ports CLOSED**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initialize each item.

- [GH] **All Lockout/Tagouts (1-5) are ACCOUNTED for.**
- [ ] **Furnace and Afterburner Control Breakers are ON.**
- [GH] **Verify Emergency Stop Pushbuttons are NOT ENGAGED**
- [ ] **BUMP Motors and switch to AUTO**

____ *Furnace Combustion Blower (M-220)*
____ *Afterburner Combustion Blower (M-130)*
____ *Afterburner I.D Fan (M-158)*

Verify field selector switches are in "AUTO" after all motor have been "BUMPED" to verify operations.

- [GH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
Interconnecting Duct NOX	204.1	204	Y
Interconnecting Duct THC	60.8	60	Y
Stack's NOX	204.1	204	Y
Stack's SO2	399.9	399	N
Stack's THC	60.8	60	Y
Stack's CO	400.5	399	N
Stack's O2	19	19.1	N
Stack's CO	19	19.1	N

** *Verify that all regulators on Calibration Gas Tanks are* ***CLOSED***

- [GH] **Datalogger/Computer is ON**

WN

1500 *Record Time (Computer Clock)*
37 *Record Ambient Air Temperature (TIT-300)*
____ *Ambient Humidity (call weather service @ 205-666-3010)*
record every 6 hours on data log sheet

Test Number	2
Ramp-Up Rate:	50°F/hr
Soak Time:	6 hrs
Soak Temp:	400 °F

LOADING/UNLOADING (2 of 3)

Date: 2 Feb 96

Time:

FIELD ACTIVITIES

Initial each item.

[VN] **Load Furnace with Materials and Thermocouples**

For each rack/bin, provide a description in terms of contents, appearance, moisture, etc.

**** Refer to loading procedures for instructions.**

_____ Rack A's Characteristics. * Scale does not work

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)

**** Secure pipe to prevent pipes from rolling**

Take Pictures

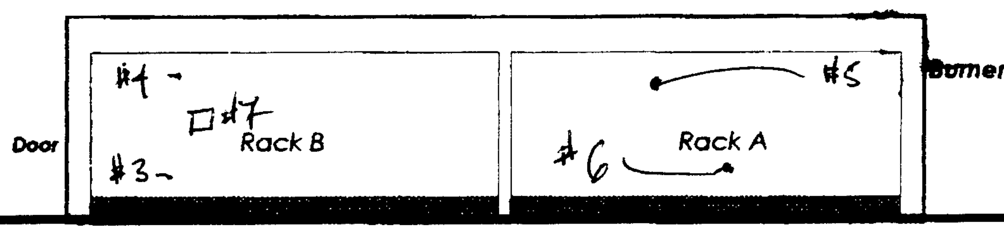
_____ Rack B's Characteristics. * Scale does not work.

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)

Take Pictures

***** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

[VN] **Mark Locations of Thermocouples**



[VN] **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[signature]
[signature]
[signature]

[ ] **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: 2 Feb 96
Time:

Rmp-Up Time: 50°F per hour
Soak Time: 6 hr
Soak Temp: 400°F

AFTERBURNER START-UP

Initial and record time for each item.

- [JH] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [JH] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [JH] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [JH] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [JH] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time
@ 1200 F: ______ :Time
@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature
1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- [JH] **Set Bleed Air Damper to 75%**
- [JH] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [JH] **Set Controller to "MANUAL". Set controller output to 0.0**
- [JH] **Turn Furnace Key to "BURNER" Position.**
- [JH] **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [ ] **Open Bleed Air Valve to 100%**
- [JH] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
  Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F. and furnace temp @ SOAK temperature.

- [JH] **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [ ] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ ] **STOP "OXIDIZER" and "AIR BLOWER"**
- [ ] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

Date: 2 Feb 9
Time:

Test Number: T2
Ramp-Up Rate: 50°/Hr
Soak Time: 6 hrs
Soak Temp: 400°F

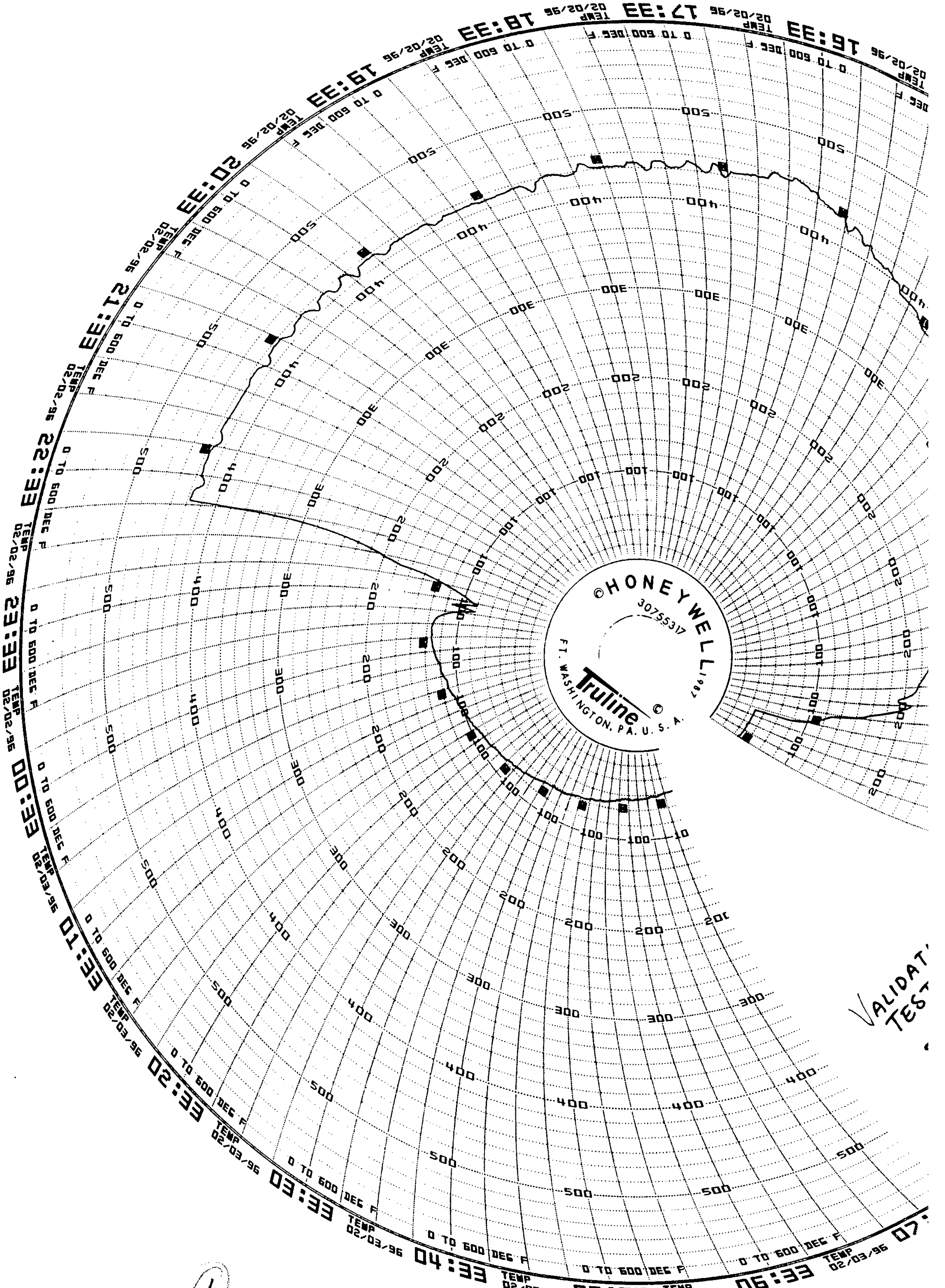
Tag	Description	Unit	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	0000
FURNACE															
PIT-232	Fuel Gas Pressure	In.WC	22.45	19.27	24.32	27.92	34.13	34.96	30.2	22.96	26.21	28.11	26.40	27.61	
FIT-231	Fuel Gas Flow	CFH	30	29	31	32	32	-2	-1	1	4	8	11	12	
PIT-222	Combustion Air Pressure	In.WC	24.82	24.97	25.02	25.16	25.33	25.47	25.46	25.4	25.41	25.58	25.41	25.61	
FIT-221	Combustion Air Flow	CFH	10822	10936	10750	10670	10559	10552	10645	10792	10853	10798	10888	10869	
PIT-158	Chamber Pressure	In.WC	-.38	-.28	-.35	-.05	.37	-.26	-.46	-.72	-.73	-.73	-.71	-.71	
TIT-201	Recorder Temperature	Deg.F	197	246	303	348	405	450	435	434	424	429	429	430	
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	200	248	304	350	401	451	438	437	427	432	431	433	
TIT-203	Material Thermocouple #1	Deg.F	154	223	273	323	366	409	408	413	403	408	406	407	
TIT-204	Material Thermocouple #2	Deg.F	165	217	269	312	360	404	401	405	398	404	403	405	
TIT-205	Material Thermocouple #3	Deg.F	117	187	232	272	327	379	397	405	404	405	407	408	
TIT-206	Material Thermocouple #4	Deg.F	158	228	279	325	372	419	415	417	409	412	411	411	
TIT-207	Material Thermocouple #5	Deg.F	181	233	289	336	389	433	420	420	408	417	413	416	
	Avg		155	217	268	313	362	408	408	412	404	409	407	409	
AFTERBURNER															
TIT-131	Combustor Burner Temp. Control	Deg. F	1816	1804	1810	1802	1798	1805	1803	1805	1802	1835	1926	1822	
FIT-140	Fumes Flow	pph ~~CFM~~	—	—	—	—	—	—	—	—	—	—	—	—	
PIT-151	Fumes Pressure (Furnace Draft)	InWC	.51	.59	.51	.40	.49	.50	.37	.26	.27	.29	.25	.29	
TIT-145	Combustor Temperature	Deg. F	1821	1811	1818	1832	1809	1812	1806	1803	1822	1810	1912	1809	
PIT-133	Fuel Pressure	PSIG	.63	.50	.45	.23	.42	.18	.14	.14	.14	.17	.16	.17	
TIT-121	Fuel Gas Flow	cfH CFM	909	811	769	651	767	636	605	605	601	645	610	456	
CEM															
NOx-B	Interconnecting Duct NOx	ppm	1.3	1.5	1.8	2.0	2.5	2.8	1.8	1.3	1.0	1.3	1.1	1.2	
THC-B	Interconnecting Duct THC	ppm	66.4	77.3	60.2	50.8	41.8	38.8	45.0	53.0	58.8	60.4	56.3	60.2	
CO	Stack's CO	ppm	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	
THC	Stack's THC	ppm	2.3	2.3	2.2	1.8	1.4	.6	.1	.3	.3	.8	.1	.7	
NOx	Stack's NOx	ppm	47.9	53.6	53.8	51.8	63.3	59.9	61.1	64.6	72.6	72.5	72.6	58.3	
SO2	Stack SO2	ppm	4.5	5.0	4.5	4.0	3.5	2.5	1.0	.5	1.0	2.5	2.5	2.5	
O2	Stack's O2	%	11.5	11.8	11.77	12.15	11.7	11.15	11.73	12.07	11.8	10.65	10.92	13.22	
CO2	Stack's CO2	%	5.9	5.68	5.74	5.58	5.82	5.90	5.98	5.58	5.46	6.60	6.66	6.18	
TIT-300	Ambient Temp	Deg. F	37	36	36	34	33	33	27.7		25.7	24.8	25.3		
Weather Service	Relative Humidity						99.9		99.9		91.9	92.3	89.9		

1

Z
0/Hr
6 hrs
400°F

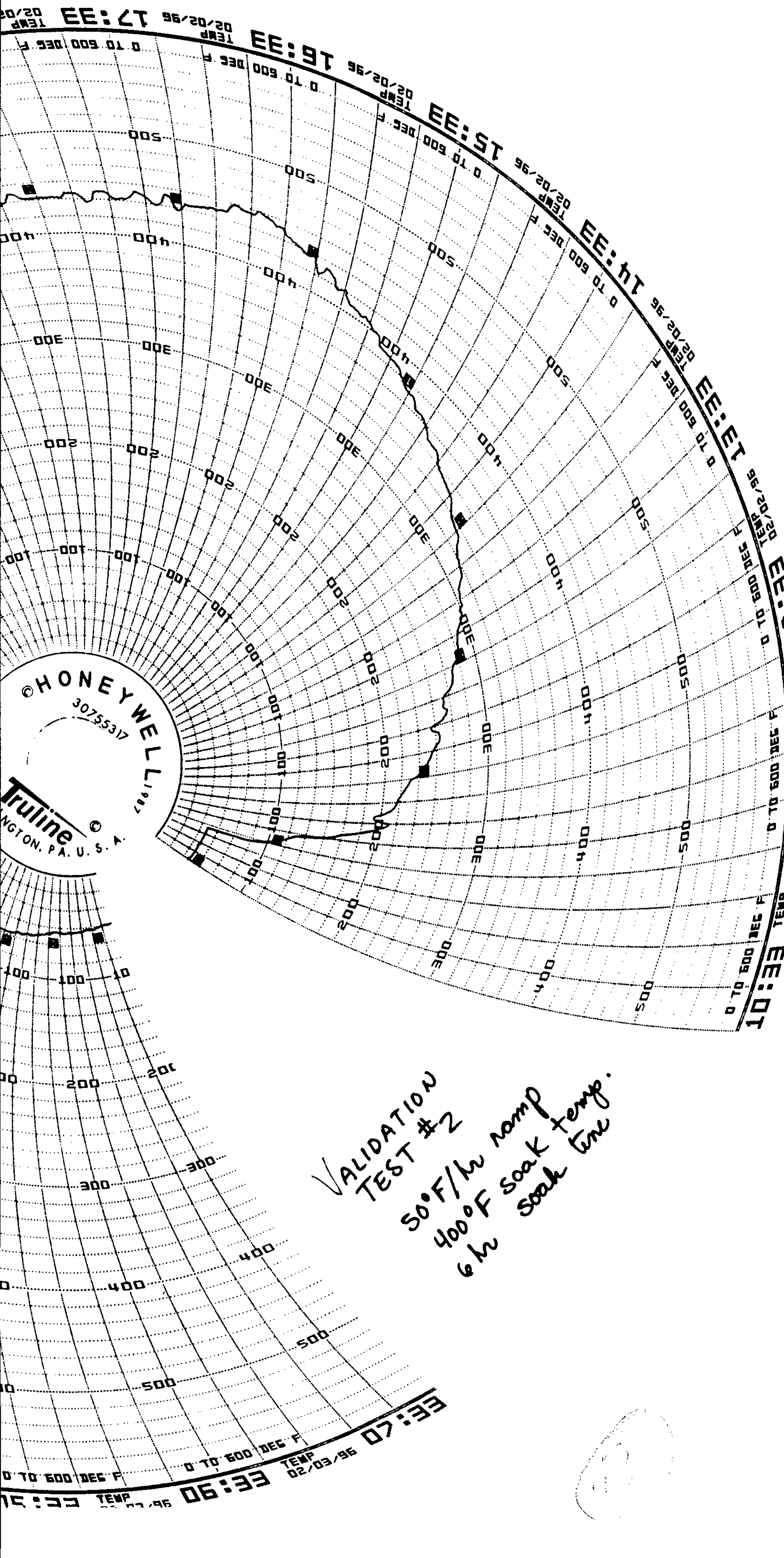
900	2000	2100	2200	2300	0000
296	26.21	28.11	26.40	27.6	
	4	8	11	12	
5.4	25.41	25.98	25.4	25.61	
92	10853	10798	10889	10869	
12	-.73	-.73	-.71	-.71	
4	424	429	429	430	
37	427	432	431	433	
3	403	408	406	407	
5	398	404	403	405	
5	404	405	407	408	
7	409	412	411	411	
20	408	417	413	416	
12	404	409	407	409	
5	1802	1835	1926	1822	
-	—	—	—	—	
6	.27	.29	.25	.29	
3	1822	1810	1912	1809	
4	.14	.17	.16	.17	
5	601	645	610	456	
3	1.0	1.3	1.1	1.2	
0	58.8	60.4	56.3	60.2	
5	-.5	-.5	-.5	-.5	
3	.3	.8	.1	.7	
6	72.6	72.5	72.6	58.3	
5	1.0	2.5	2.5	2.5	
7	11.8	10.65	10.92	13.22	
8	5.46	6.60	6.66	6.18	
	25.7	24.8	25.3		
	91.9	92.3	89.9		

2



©HONEYWELL
30755317
Truline ©
FT. WASHINGTON, PA. U.S.A.
0 TO 600 DEG F
TEMP
02/03/96
04:33
05:33
06:33

1



VALIDATION
TEST #2
50°F/hr ramp
400°F soak temp.
6 hr soak time

Pre - START-UP (1 of 3)

Date: 4 Feb 96
Time:

Test Number: T 3
Ramp-Up Rate: 50°/HR
Soak Time: 4 Hrs
Soak Temp: 500°

MECHANICAL

Initial each item.

- **Inspection doors/manways are SECURED**
- **Gas Valves OPEN**
- **View/Inspection Ports CLOSED**
- **Record Gas (Propane) Valve Position** 80%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- **Furnace and Afterburner Control Breakers are ON.**
- **Verify Emergency Pushbuttons are NOT ENGAGED.**
- **BUMP Motors and switch to "AUTO"**
  - ✓ *Furnace Combustion Blower (M-220)*
  - ✓ *Afterburner Combustion Blower (M-130)*
  - ✓ *Afterburner I.D Fan (M-158)*
  - ✓ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	204.1	~~215~~ 204	N
✓ Interconnecting Duct - THC	91.5	~~103~~ 90	Y
✓ Stack NOx	204.1	~~209~~ 203	N
✓ Stack SO2	399.1	~~415~~ 400	Y
✓ Stack THC	91.5	90	Y
✓ Stack CO	437.4	437	Y
✓ Stack O2	21.8	22	
Stack CO	437.4	440	Y

See attached sheets.

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- **Datalogger/Computer is ON**
  - ✓ *Record Time (Computer Clock)*
  - ✓ *Record Ambient Temperature (TIT-300)*
  - ✓ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

- **Pre - Spike Activities**
  - *Lock-out all Motors; Complete Exclusion Log*
  - *Secure Equipment Pad and Access Road w/ Chains*
  - *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: Feb 4 96
Time:

Test Number: T3
Ramp-Up Rate: 50°/Hr
Soak Time: 4 Hrs
Soak Temp: 500°

FIELD ACTIVITIES

Initial each item.

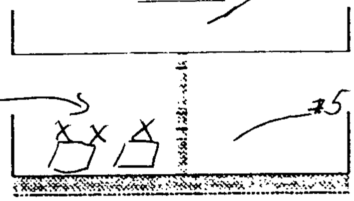
For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

☑ **Load Furnace with Materials and Thermocouples**

_____ Rack A's Characteristics.

RACK #1

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
SCALE NOT	WORKING	#4		
		SPIKES #5		

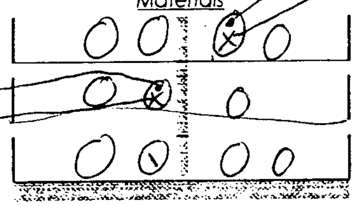


**** Secure pipe to prevent pipes from rolling**

Take Pictures

_____ Rack B's Characteristics.

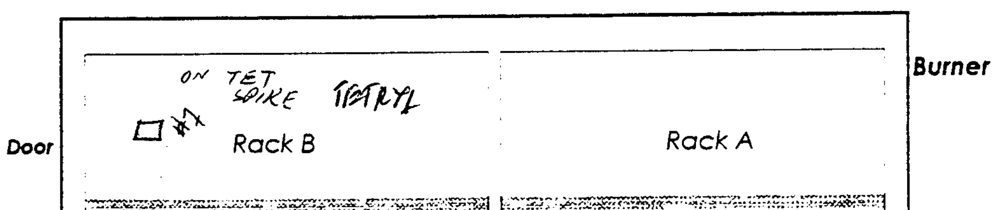
Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
SCALE NOT	WORKINGS	#6 TNT SPIKE		
		#3 RDX SPIKE		



Take Pictures

**** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☑ **Mark Locations of Thermocouples**



☑ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[illegible]
[illegible]
[illegible]

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

Test #T3

START-UP (3 of 3)

Date: 4 Feb 96
Time:

Rmp-Up Time:
Soak Time: 4 Hrs
Soak Temp: 500°

AFTERBURNER START-UP

Initial and record time for each item.

AH **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**

AH **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**

AH **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

AH **Start "DATALOGGER" Pushbuttons on the Computer.**

AH **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ________ :Time
@ 1200 F: ________ :Time
@ 1800F: ________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

AH **Set Bleed Air Damper to ~~75%~~** 60% due to cold air

AH **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**

AH **Set Controller to "MANUAL". Set controller output to 0.0**

AH **Turn Furnace Key to "BURNER" Position.**

AH **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

AH **Open Bleed Air Valve to ~~100%~~** Left at 60%

AH **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

AH **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

AH **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**

AH **STOP "OXIDIZER" and "AIR BLOWER"**

AH **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

Date: 04 FEB. 96
Time:

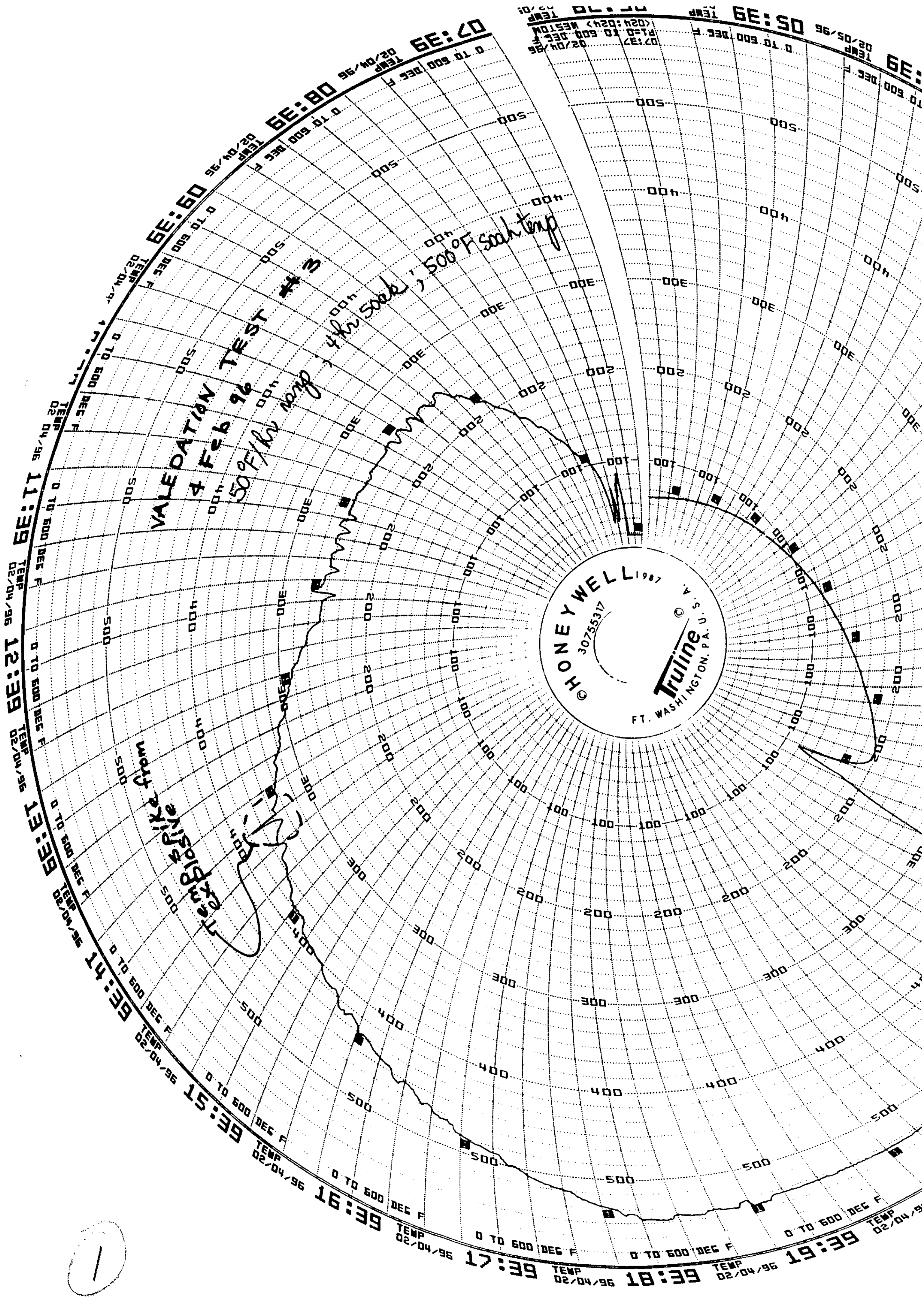
Test Number: T3
Ramp-Up Rate: 50°/HR
Soak Time: 4 Hrs
Soak Temp: 500°

Tag	Description	Unit	0900	1000	11:00	1200	13:00	14:00	1500	1600	1700	1800	1900	2000	2100	2200
FURNACE																
PIT-232	Fuel Gas Pressure	In. WC	14.93	22.93	18.66	20.46	19.68	22.92	24.27	29.73	32.69	36.91	37.34	33.00	32.99	30.95
FIT-231	Fuel Gas Flow	CFH	31	23	30	29	29	30	31	32	33	34	34	33	33	33
PIT-222	Combustion Air Pressure	In. WC	26.93	27.20	26.95	26.86	26.60	26.68	26.74	26.91	27.01	22.09	27.16	27.15	27.18	27.25
FIT-221	Combustion Air Flow	CFH	11095	10642	10866	10703	10766	10578	10534	10388	10325	10223	10283	10373	10391	10478
PIT-158	Chamber Pressure	In. WC	-.61	-.47	-0.47	-0.46	-0.46	-0.42	-0.39	-0.38	-.34 ~~10325~~	-.31	-.41	-0.55	-.54	-.63
TIT-201	Recorder Temperature	Deg. F	136	255	250	254	253	299	345	377	444	495	546	539	537	535
TIT-202	Furnace Exit Gas Temp (Control)	Deg. F	137	256	251	256	255	301	344	401	449	500	551	543	542	540
TIT-203	Material Thermocouple #1	Deg. F	106	227	227	229	229	278	323	379	428	482	542	534	535	535
TIT-204	Material Thermocouple #2	Deg. F	103	202	221	230	232	264	306	353	397	445	498	506	508	508
TIT-205	Material Thermocouple #3	Deg. F	70	148	171	185	198	219	254	290	327	372	424	448	462	471
TIT-206	Material Thermocouple #4	Deg. F	101	213	219	219	221	261	304	354	398	448	507	505	506	511
FIT-207	Material Thermocouple #5	Deg. F	127	250	240	248	243	296	343	396	446	501	554	543	543	540
	AVG.											450	505	507	510	513
AFTERBURNER																
TIT-131	Combustor Burner Temp. Control	Deg. F	1811	1814	1822	1825	1807	1811	1806	1815	1816	1797	1838	1784	1785	1822
FIT-148	Fumes Flow PPH	~~CFM~~	597									—	—	—	—	—
PIT-151	Fumes Pressure (Furnace Draft)	In. WC	0.47	0.43	0.45	0.46	0.43	0.37	0.39	0.39	0.36	.34	.28	0.24	.25	.20
TIT-145	Combustor Temperature	Deg. F	1816	1807	1812	1811	1811	1817	1814	1821	1827	1818	1846	1792	1793	1830
PIT-133	Fuel Pressure	PSIG	0.72	0.46	0.51	0.51	0.50	0.29	0.22	0.15	0.10	.15	.09	0.08	.08	.08
TIT-121	Fuel Gas Flow CFH	CFM	947	805	872	820	778	709	664	615	521	551	502	458	458	457
CEM																
NOx-B	Interconnecting Duct NOx	ppm	0.3	0.2	2.5	2.2	2.2	2.5	2.9	3.3	3.8	4.5	4.5	4.0	4.3	4.3
THC-B	Interconnecting Duct THC	ppm	69.9	75.9	21.6	68.5	73.8	84.4	71.5	70.0	67.8	72.1	100.0	100.0	100.0	-14.2
CO	Stack's CO	ppm	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	.5	.5
THC	Stack's THC	ppm	0.4	0.5	0.9	1.1	2.5	6.0	5.7	5.3	5.9	-4.5	-4.6	-4.5	-4.5	-4.5
NOx	Stack's NOx	ppm	48.0	50.6	84.4	57.2	51.2	56.6	62.6	64.5	56.7	61.8	65.2	62.9	62.8	68.4
SO2	Stack SO2	ppm	9.2	5.0	10.45	-1.5	-0.5	1.5	1.5	2.0	2.0	1.0	1.5	1.5	1.0	.5
O2	Stack's O2	%	12.48	12.88	10.35	12.88	12.30	12.05	11.95	11.88	12.43	11.93	11.35	11.98	11.98	11.7
CO2	Stack's CO2	%	5.96	5.54	4.27	5.46	6.14	5.92	6.05	6.08	5.70	5.96	6.44	6.08	6.10	6.28
TIT-300	Ambient Temp	Deg. F	17°	21°	20	17	23.8	22.2	22.9	23.3	20.1	16.4	14.3	13.1	14.2	13.2
Weather Service	Relative Humidity		51.9	43.7	50.8	44.3	46.9	50.7	51.7	49.8	60.0	73.2	72.6	87.0	73.0	76.9

3
°/HR
Hrs
0°

1600	1700	1800	1900	2000	2100	2200	2250
29.73	32.69	36.91	37.34	33.00	32.99	30.95	31.85
32	33	34	34	33	33	33	33
26.91	27.01	27.09	27.16	27.15	27.18	27.25	27.86
10388	10325	10273	10283	10373	10391	10478	10463
-0.38	-.34 16325	-.31	-.41	-0.55	-.54	-.63	-.63
397	444	495	546	559	537	535	533
401	449	500	551	543	542	540	533
379	428	482	542	534	535	535	533
353	397	445	498	506	508	508	507
290	327	372	424	448	462	471	475
354	398	448	507	505	506	511	507
396	446	501	554	543	543	540	539
		450	505	507	510	513	512
1815	1816	1797	1838	1784	1785	1822	1816
/	/	—	—	—	—	—	—
0.39	0.36	.34	.28	0.24	.25	.20	.21
1821	1827	1818	1846	1792	1793	1830	1823
0.15	0.10	.15	.09	0.08	.08	.08	.08
615	521	551	502	458	458	457	455
3.3	3.8	4.5	4.5	4.0	4.3	4.3	4.2
70.0	67.8	72.1	100.0	100.0	100.0	-14.2	-14.2
0.0	0.0	0.0	0.0	0.0	.5	.5	.5
5.3	5.9	-4.5	-4.6	-4.5	-4.5	-4.5	-4.5
64.5	56.7	61.8	65.2	62.9	62.8	68.4	67.0
2.0	2.0	1.0	1.5	1.5	1.0	.5	.5
11.88	12.43	11.93	11.35	11.98	11.98	11.7	11.75
6.08	5.70	5.96	6.44	6.08	6.10	6.28	6.26
23.3	20.1	16.4	14.3	13.1	14.2	13.2	
49.8	60.0	73.2	72.6	87.0	73.0	76.9	

2


VALEDATION TEST #3
4 Feb 96
50°F/hr ramp, 4 hr soak, 500°F soak temp
Temp spike from
Explosive
HONEYWELL 1987
30755317
Truline
FT. WASHINGTON, PA. U.S.A.
0 TO 600 DEC F
TEMP 02/04/96 11:39
TEMP 02/04/96 12:39
TEMP 02/04/96 13:39
TEMP 02/04/96 14:39
TEMP 02/04/96 15:39
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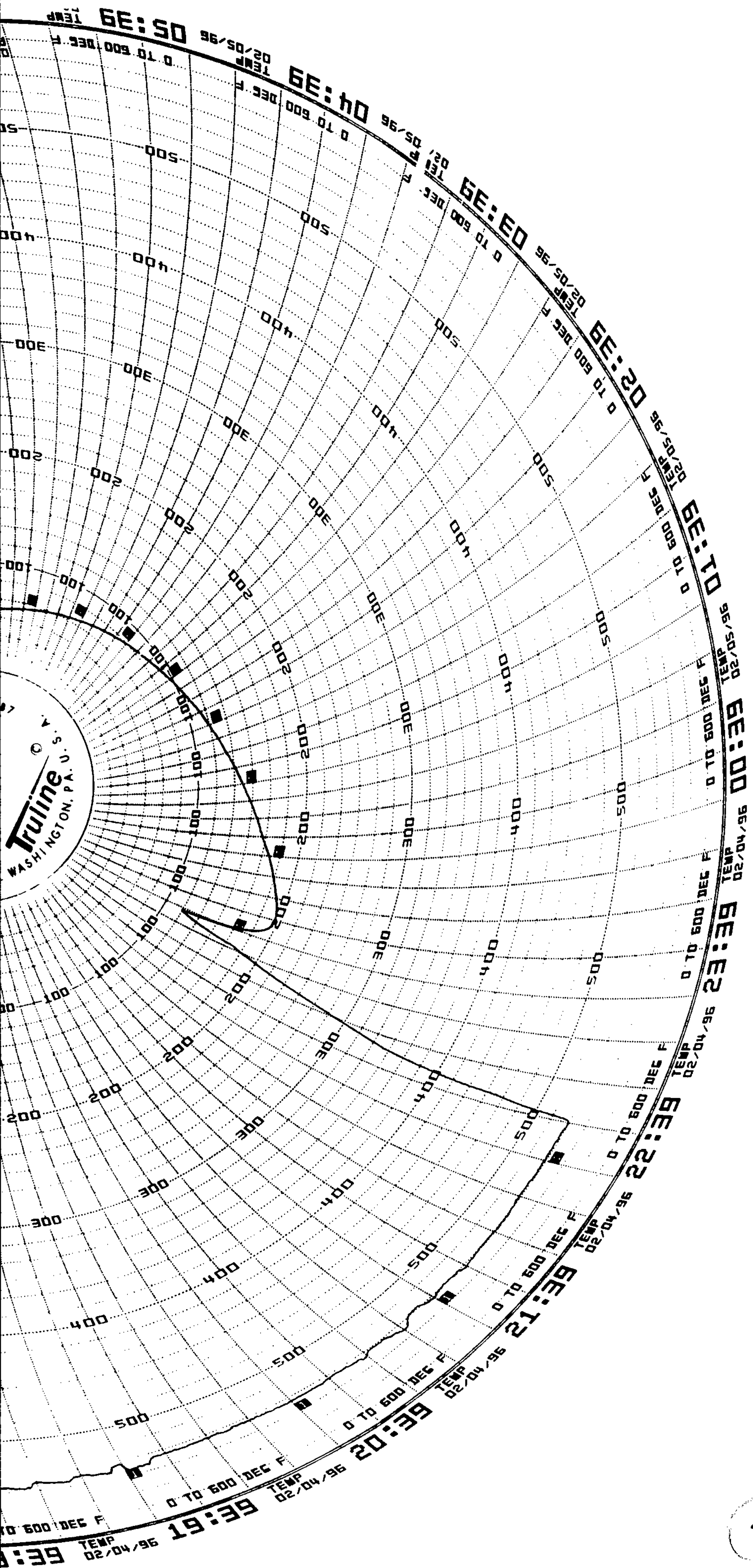
TEMP 02/04/96 19:39


Truline
WASHINGTON, PA. U.S.A.
0 TO 600 DEG F
TEMP 02/04/96
19:39
20:39
21:39
22:39
23:39
00:39
TEMP 02/05/96
01:39
02:39
03:39
04:39
05:39
100
200
300
400
500

Pre - START-UP (1 of 3)		*Test Number:*	T4
Date:	6 FEB 96	*Ramp-Up Rate:*	75°/Hr
		Soak Time:	6 Hrs
Time:	1630	*Soak Temp:*	500°

MECHANICAL

Initial each item.

- KJK **Inspection doors/manways are SECURED**
- KJK **Gas Valves OPEN**
- KJK **View/Inspection Ports CLOSED**
- KJK **Record Gas (Propane) Valve Position** 75%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- KJK **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- KJK **Furnace and Afterburner Control Breakers are ON.**
- KJK **Verify Emergency Pushbuttons are NOT ENGAGED.**
- TJB **BUMP Motors and switch to "AUTO"**
  - ___ *Furnace Combustion Blower (M-220)*
  - ___ *Afterburner Combustion Blower (M-130)*
  - ___ *Afterburner I.D Fan (M-158)*
  - ___ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- JH **Calibrate CEM**

	Tank Values	Recorded Values ANALYZER	LOGGER	Adjustment (Y/N)
✓ *Interconnecting Duct - NOx*	204.1	204	205	Y
✓ *Interconnecting Duct - THC*	91.5	90	91.8	Y
✓ *Stack NOx*	204.1	204	204.6	N
✓ *Stack SO2*	399.9	399	399.0	Y
✓ *Stack THC*	91.5	915	91.1	Y
✓ *Stack CO*	437.4	440	437.0	Y
✓ *Stack O2*	21.89	21.0	21.85	Y
✓ *Stack CO2*	17.95	17.95	17.92	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- TJB **Datalogger/Computer is ON**
  - ✓ *Record Time (Computer Clock)*
  - ✓ *Record Ambient Temperature (TIT-300)*
  - ✓ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

- VVY **Pre - Spike Activities**
  - VVY *Lock-out all Motors; Complete Exclusion Log*
  - VVY *Secure Equipment Pad and Access Road w/ Chains*
  - VVY *Spike Test Materials and Furnace Test Plates*

	Test Number
LOADING/UNLOADING (2 of 3)	Ramp-Up Rate:
Date: 6 FEB 96	Soak Time:
Time: 1630	Soak Temp:

FIELD ACTIVITIES

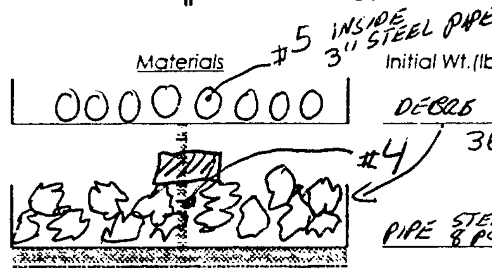
Initial each item.

[KJK] **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
***** Refer to loading procedures for instructions.***

#1 Rack A's Characteristics. (1453 LBS)

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
RACK 600 LBS			DEBRIS STEEL 369 LBS	
CONCRETE DEBRIS 365 LBS			PIPE STEEL 8 PCS 121 LBS	

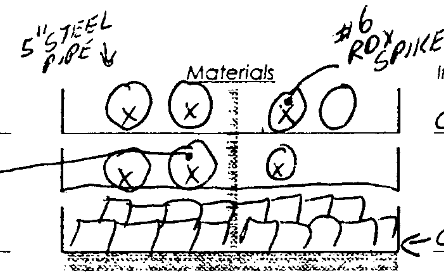


**** Secure pipe to prevent pipes from rolling**

Take Pictures

#2 Rack B's Characteristics. (1547 LBS)

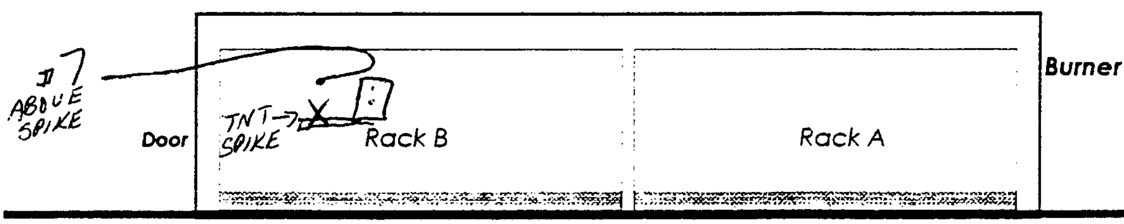
Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
RACK= 430 LBS			CLAY PIPE 205 LBS	
5" STEEL PIPE 240 LBS			CINDER BLOCKS 672 LBS	



Take Pictures

***** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

[KJK] **Mark Locations of Thermocouples**



[KJK] **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[signature]
Roger McDaniel
Kevin J. Kleinhert

[ ] **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

Date: ____________________ **Rmp-Up Time:** ____________________

Time: ____________________ **Soak Time:** ____________________

Soak Temp: ____________________

AFTERBURNER START-UP

Initial and record time for each item.

- [ ] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [ ] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [ ] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [ ] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [ ] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: __________ :Time

@ 1200 F: __________ :Time

@ 1800F: __________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [ ] **Set Bleed Air Damper to 75%**
- [ ] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [ ] **Set Controller to "MANUAL". Set controller output to 0.0**
- [ ] **Turn Furnace Key to "BURNER" Position.**
- [ ] **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [ ] **Open Bleed Air Valve to 100%**
- [ ] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [ ] **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

*** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS*

COOL-DOWN

Initial and record time for each item.

- [ ] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ ] **STOP "OXIDIZER" and "AIR BLOWER"**
- [ ] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

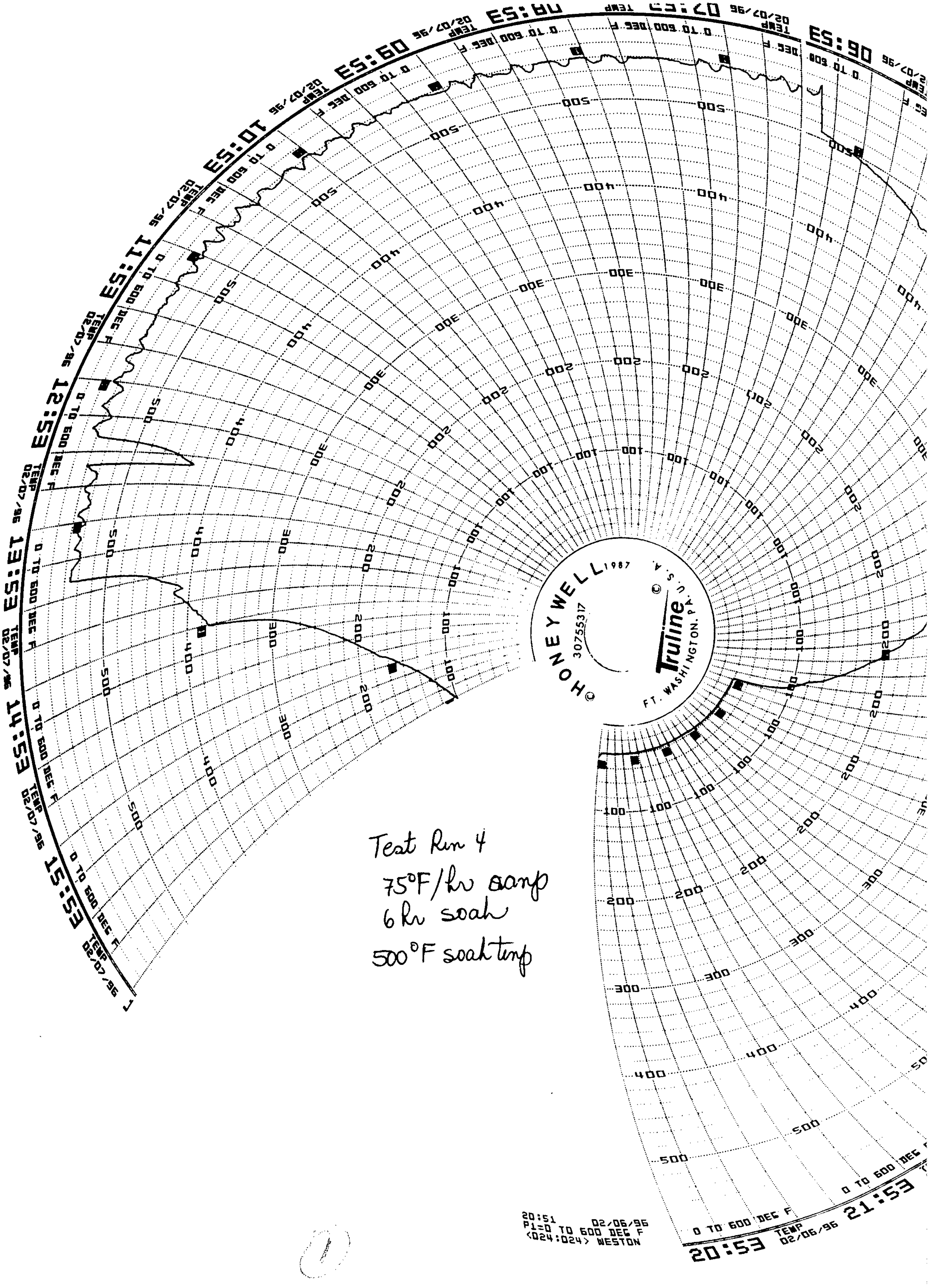
*** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.*

Test Number: #4
Ramp-Up Rate: 75°/hr
Soak Time: 6 hrs
Soak Temp: 500°F

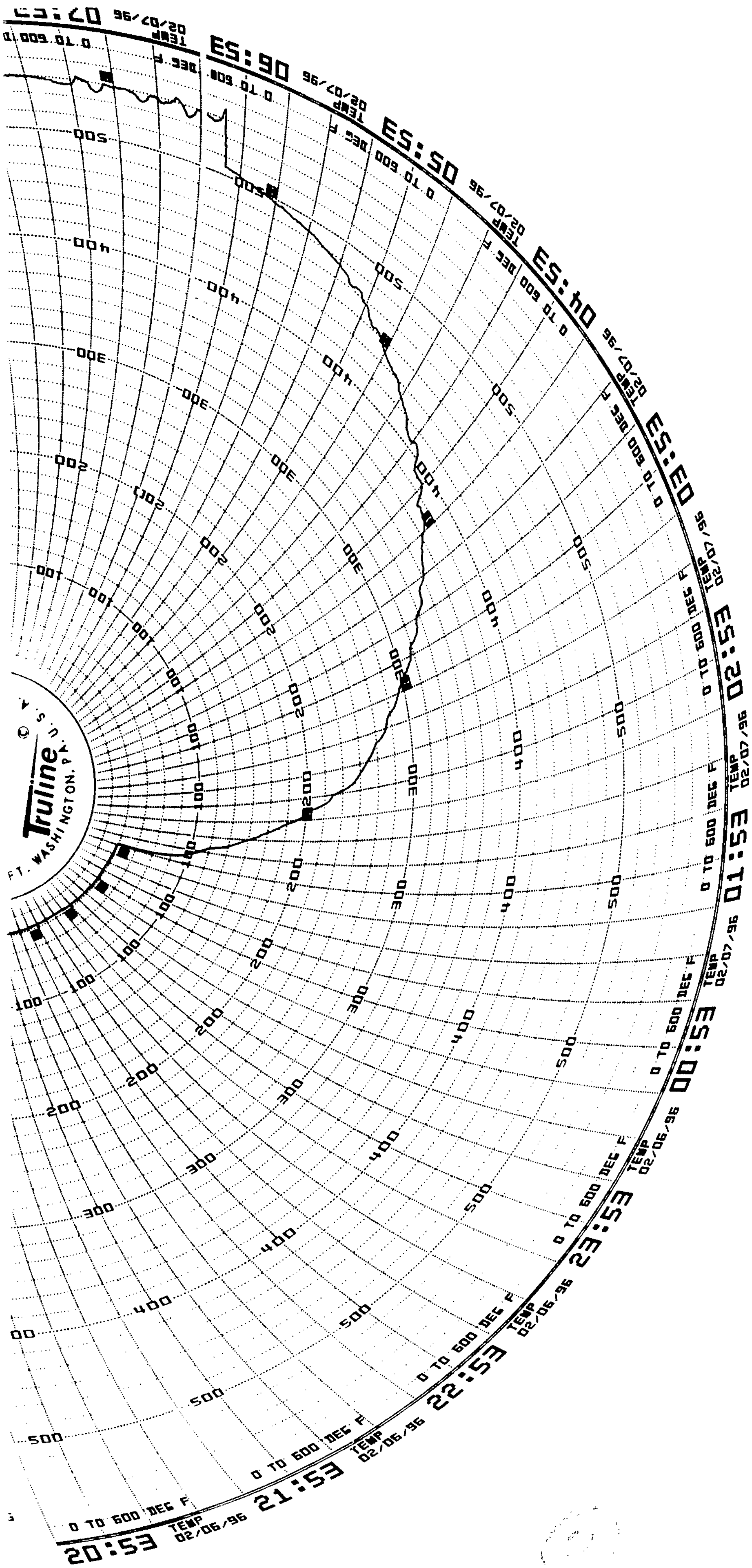
HOURLY DATALOG (___ of ___)

Date: 6 FEB 96
Time:

Tag	Description	Unit	2200	2300	2400	
		Time:				
FURNACE						
PIT-232	Fuel Gas Pressure	In.WC	3.68	3.76	3.76	
FIT-231	Fuel Gas Flow	CFH	-0	-0	-0	
PIT-222	Combustion Air Pressure	In.WC	24.94	25.02	24.98	
FIT-221	Combustion Air Flow	CFH	11980	11977	11959	
PIT-158	Chamber Pressure	In.WC	-0.30	-.29	-0.28	
TIT-201	Recorder Temperature	Deg.F	32	31	30	
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	32	31	-1.0	
TIT-203	Material Thermocouple #1	Deg.F	34	32	32	
TIT-204	Material Thermocouple #2	Deg.F	36	34	33	
TIT-205	Material Thermocouple #3	Deg.F	33	32	31	
TIT-206	Material Thermocouple #4	Deg.F	31	30	30	
TIT-207	Material Thermocouple #5	Deg.F	34	32	32	
AFTERBURNER						
TIT-131	Combustor Burner Temp. Control	Deg. F	1795	1801	1796	
FIT-149	Fumes Flow	PPH	2264	2110	2107	
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.50	0.45	0.45	
TIT-145	Combustor Temperature	Deg. F	1799	1798	1801	
PIT-133	Fuel Pressure	PSIG	0.78	0.72	0.74	
TIT-121	Fuel Gas Flow	CFH	1029	971	981	
CEM						
NOx-B	Interconnecting Duct NOx	ppm	-0.9	-1.0	-1.0	
THC-B	Interconnecting Duct THC	ppm	0.0	0.0	0.0	1.3
CO	Stack's CO	ppm	0.0	0.5	-0.5	
THC	Stack's THC	ppm	-4.5	-6.0	1.2	
NOx	Stack's NOx	ppm	-3.0	2.5	40.0	
SO2	Stack SO2	ppm	-2.5	-2.5	-2.5	
O2	Stack's O2	%	20.65	20.70	18.90	
CO2	Stack's CO2	%	0.10	0.78	18.90	
TIT-300	Ambient Temp	Deg. F	26.70			
Weather Service	Relative Humidity		99.5			



Test Run 4
75°F/hr ramp
6 hr soak
500°F soak temp


Truline
FT. WASHINGTON, PA. U.S.A.
0 TO 600 DEC F
TEMP 02/06/96
20:53
21:53
22:53
23:53
TEMP 02/07/96
00:53
01:53
02:53

Pre - START-UP (1 of 3)

Date: 7 /25/96

Time: 19 20

Test Number: 5

Ramp-Up Rate: 75° F / Hr

Soak Time: 4 Hrs

Soak Temp: 600° F

MECHANICAL

Initial each item.

[H.T.] **Inspection doors/manways are SECURED**

[H.T.] **Gas Valves OPEN**

[H.T.] **View/Inspection Ports CLOSED**

[ ] **Record Gas (Propane) Valve Position** 75%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

[H.T.] **All Lockout/Tagouts (1-5) are ACCOUNTED.**

[H.T.] **Furnace and Afterburner Control Breakers are ON.**

[H.T.] **Verify Emergency Pushbuttons are NOT ENGAGED.**

[H.T.] **BUMP Motors and switch to "AUTO"**

_____ Furnace Combustion Blower (M-220)

_____ Afterburner Combustion Blower (M-130)

_____ Afterburner I.D Fan (M-158)

_____ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[H.T.] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	204.1	204	N
✓ Interconnecting Duct - THC	91.5	91	Y
✓ Stack NOx	204.1	204	N
✓ Stack SO2	399.9	399	Y
✓ Stack THC	91.5	90	Y
✓ Stack CO	437.4	442	N
✓ Stack O2	21.89	21.8	Y
✓ Stack CO	17.95	17.95	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[H.T.] **Datalogger/Computer is ON**

_____ Record Time (Computer Clock)

_____ Record Ambient Temperature (TIT-300)

_____ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

[ ] **Pre - Spike Activities**

_____ Lock-out all Motors; Complete Exclusion Log

_____ Secure Equipment Pad and Access Road w/ Chains

_____ Spike Test Materials and Furnace Test Plates

LOADING/UNLOADING (2 of 3)

Date: 2-7-96
Time: 1945

Test Number
Ramp-Up Rate:
Soak Time:
Soak Temp:

FIELD ACTIVITIES

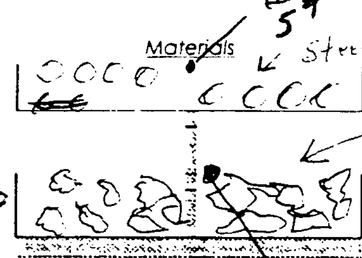
Initial each item.

B.T. **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. (1434) DRY 1408

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
Rack Loc#			Debre Steel	1351#
Concrete Debre 976#			steel pipe 8 pcs.	1453#

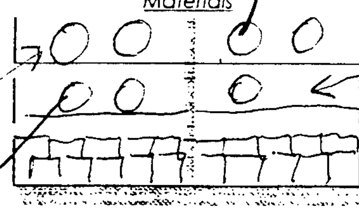


**** Secure pipe to prevent pipes from rolling**

Take Pictures

#2 Rack B's Characteristics. DRY 1493 #7 wall RDX TeT #6 #4 over Tet

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
Rack 430#			clay pipe	1252#
5' Steel pipe 1496#			cinderblocks	1045#



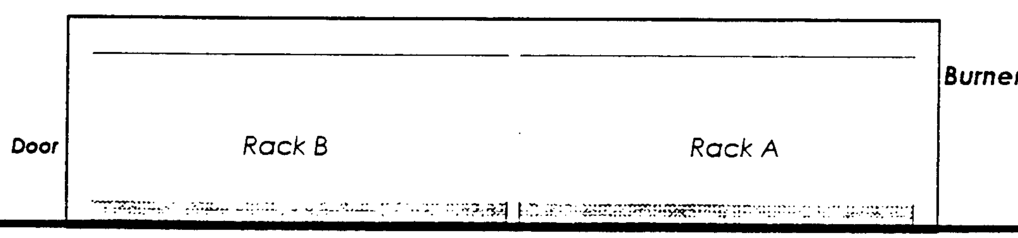
24"

#3 RDX

Take Pictures

** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks*
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

B.T. **Mark Locations of Thermocouples**



B.T. **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

JH **Complete Spike Sample Weigh Sheet**

**** *SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: 2-7-96

Time:

Rmp-Up Time:

Soak Time:

Soak Temp:

AFTERBURNER START-UP

Initial and record time for each item.

- TB Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC
- TB Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC
- TB Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- TB Start "DATALOGGER" Pushbuttons on the Computer.
- TB Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC

@ 600 F: ______ :Time

@ 1200 F: ______ :Time

@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- TB Set Bleed Air Damper to 75%
- TB Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC
- TB Set Controller to "MANUAL". Set controller output to 0.0
- TB Turn Furnace Key to "BURNER" Position.
- TB Verify "INTERLOCK OK" Light is energized.

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- TB Open Bleed Air Valve to 100%
- TB Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- TB Manually Log Operating Parameters.

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

*** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS*

COOL-DOWN

Initial and record time for each item.

- RQK Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.
- RQK STOP "OXIDIZER" and "AIR BLOWER"
- RQK STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.

*** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.*

RACK #1 ~~DRY~~ 1434 - Whole Rack

w/o PIPE 1315? -

ROCKS

STL

~~CON~~

Rack #1

Rack weigh 600 # ?

Rack + 375 lbs of Concret Debris. 976 ?

Rack + Concrete Debris + Steel Debris (375) 1351 ?

1453

Pipe 8 pieces

Rack #2

Total Rack 14.96

~~Rack +~~ w/o Pipe 1252

w/o Pipe + Clay 1048

w/ Pipe + Clay + Blocks 430

Test Number: # 4
Ramp-Up Rate: 75°F/hr
Soak Time: 6 hrs
Soak Temp: 500°F

HOURLY DATALOG (__ of __)

Date: 7 FEB 96
Time:

Tag	Description	Unit	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600
FURNACE																		
PIT-232	Fuel Gas Pressure	in.WC	3.71	3.68	10.28	10.46	10.91	11.30	11.32	11.4	11.18	10.86	10.60	10.70	10.44	8.08	3.58	
FIT-231	Fuel Gas Flow	CFH	-0	-0	65	74	87	108	109	117	108	102	94	104	98	39	0	
PIT-222	Combustion Air Pressure	in.WC	24.88	24.78	25.88	25.95	25.87	25.92	25.80	25.78	25.63	25.29	25.03	24.96	24.69	24.18	25.51	
FIT-221	Combustion Air Flow	CFH	11948	11936	10380	10275	10152	10041	10628	9958	9984	9963	9959	9892	9875	10457	11525	
PIT-158	Chamber Pressure	in.WC	-0.28	-.29	-.29	-.26	-.23	-0.25	-0.22	-0.21	-.20	-.22	.26	-.25	-.30	-0.20	-0.14	
TIT-201	Recorder Temperature	Deg.F	31	32	217	276	375	445	496	546	550	546	539	546	548	451	317	
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	31	32	220	299	379	449	501	554	554	550	543	549	551	451	312	
TIT-203	Material Thermocouple #1	Deg.F	33	34	211	297	376	443	498	552	550	546	541	545	547	469	340	
TIT-204	Material Thermocouple #2	Deg.F	33	33	98	159	218	275	327	376	410	435	455	473	483	477	430	
TIT-205	Material Thermocouple #3	Deg.F	32	33	166	259	327	392	443	496	502	504	507	513	515	478	552	
TIT-206	Material Thermocouple #4	Deg.F	31	32	177	247	320	389	435	496	497	489	506	530	531	459	261	
TIT-207	Material Thermocouple #5	Deg.F	32	33	240	323	403	485	531	586	577	577	578	598	588	474	530	
AVG.										510		529					
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1794	1814	1807	1804	1810	1811	1801	1799	1821	1821	1784	1784	1789	1809	1827	
FIT-140	Fumes Flow	PPH ~~CFM~~	2120	2337	2253	2202	2158	2355	2213	2258	2253	2229	2192	2169	2120	2258	2151	
PIT-151	Fumes Pressure (Furnace Draft)	inWC	0.45	0.60	0.51	0.39	0.40	0.58	0.48	0.42	-.35	.30	.32	.30	.25	0.54	0.32	
TIT-145	Combustor Temperature	Deg. F	1796	1813	1811	1811	1813	1825	1817	1801	1810	1809	1787	1835	1810	1794	1832	
PIT-133	Fuel Pressure	PSIG	0.72	0.79	0.56	0.48	0.25	0.17	0.15	0.14	.14	.11	.23	.05	.06	0.11	0.14	
TIT-121	Fuel Gas Flow	CFH ~~CFM~~	972	1047	859	771	661	629	602	601	582	550	664	357	618	604	609	
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-1.1	1.3	-0.9	-0.6	0.1	0.6	1.1	1.9	1.8	2.0	1.6	1.7	1.7	0.2	0.0	
THC-B	Interconnecting Duct THC	ppm	0.0	0.0	53.6	54.4	53.0	45.0	47.1	43.8	42.8	44.1	41.8	38.1	39.2	41.1	4.8	
CO	Stack's CO	ppm	-0.5	27.2	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-.5	-.5	0.0	0.0	0.0	0.0	0.0	
THC	Stack's THC	ppm	-4.6	-4.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
NOx	Stack's NOx	ppm	47.8	-4.0	44.9	47.0	59.5	53.2	56.1	64.6	53.5	69.2	46.0	44.	87.1	93.3	102	
SO2	Stack SO2	ppm	-2.0	-2.5	-2.5	-2.0	-1.0	-0.5	-0.5	0.0	0.0	.5	6.0	0.0	-0.5	1.0	1.0	
?	Stack's O2	%	17.40	15.35	15.46	14.13	13.50	12.58	12.15	11.85	11.77	11.75	11.77	11.82	11.80	10.5	12.05	
CO2	Stack's CO2	%	5.64	0.26	6.04	6.08	6.10	6.16	6.24	6.62	5.70	6.48	5.12	5.56	4.86	5.60	4.98	
TIT-300	Ambient Temp	Deg. F	26.5				31.3		34.8	34	40.8	50.6	55	57	62.2	53	52	
Weather Service	Relative Humidity		99.9				90.7		85.8		66.4	52.0	37	32.3	30.2		42.6	

HOURLY DATALOG (__ of __)

Date: 7 FEB 96

Time:

Test Number: # 5

Ramp-Up Rate: 75 °F/hr

Soak Time: 4 hrs

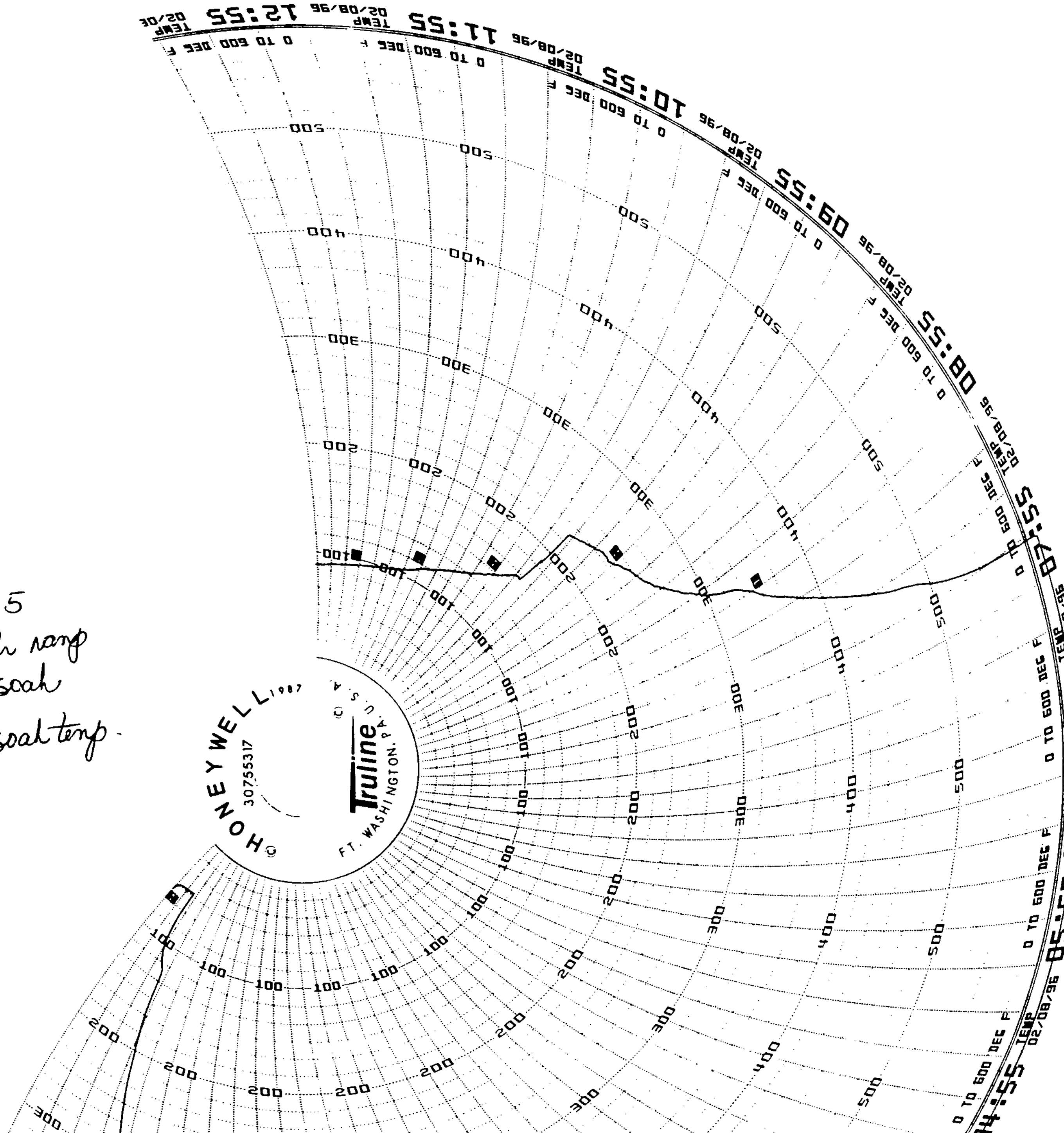
Soak Temp: 600 °F

Tag	Description	Unit	Time: 2400															
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	11.39															
FIT-231	Fuel Gas Flow	CFH	94															
PIT-222	Combustion Air Pressure	In.WC	25.2															
FIT-221	Combustion Air Flow	CFH	10430															
PIT-158	Chamber Pressure	In.WC	-0.30															
TIT-201	Recorder Temperature	Deg.F	307															
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	308															
TIT-203	Material Thermocouple #1	Deg.F	314															
TIT-204	Material Thermocouple #2	Deg.F	238															
TIT-205	Material Thermocouple #3	Deg.F	236															
TIT-206	Material Thermocouple #4	Deg.F	245															
TIT-207	Material Thermocouple #5	Deg.F	335															
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1806															
FIT-149	Fumes Flow	PPH ~~GPM~~	2338															
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.48															
TIT-145	Combustor Temperature	Deg. F	1862															
PIT-133	Fuel Pressure	PSIG	0.63															
TIT-121	Fuel Gas Flow	CFH ~~GPM~~	902															
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.2															
THC-B	Interconnecting Duct THC	ppm	100															
CO	Stack's CO	ppm	-0.5															
THC	Stack's THC	ppm	0.0															
NOx	Stack's NOx	ppm	48.9															
SO2	Stack SO2	ppm	4.0															
?	Stack's O2	%	11.63															
CO2	Stack's CO2	%	5.76															
TIT-300	Ambient Temp	Deg. F	39															
Weather Service	Relative Humidity		97.8															

HOURLY DATALOG (__ of __)

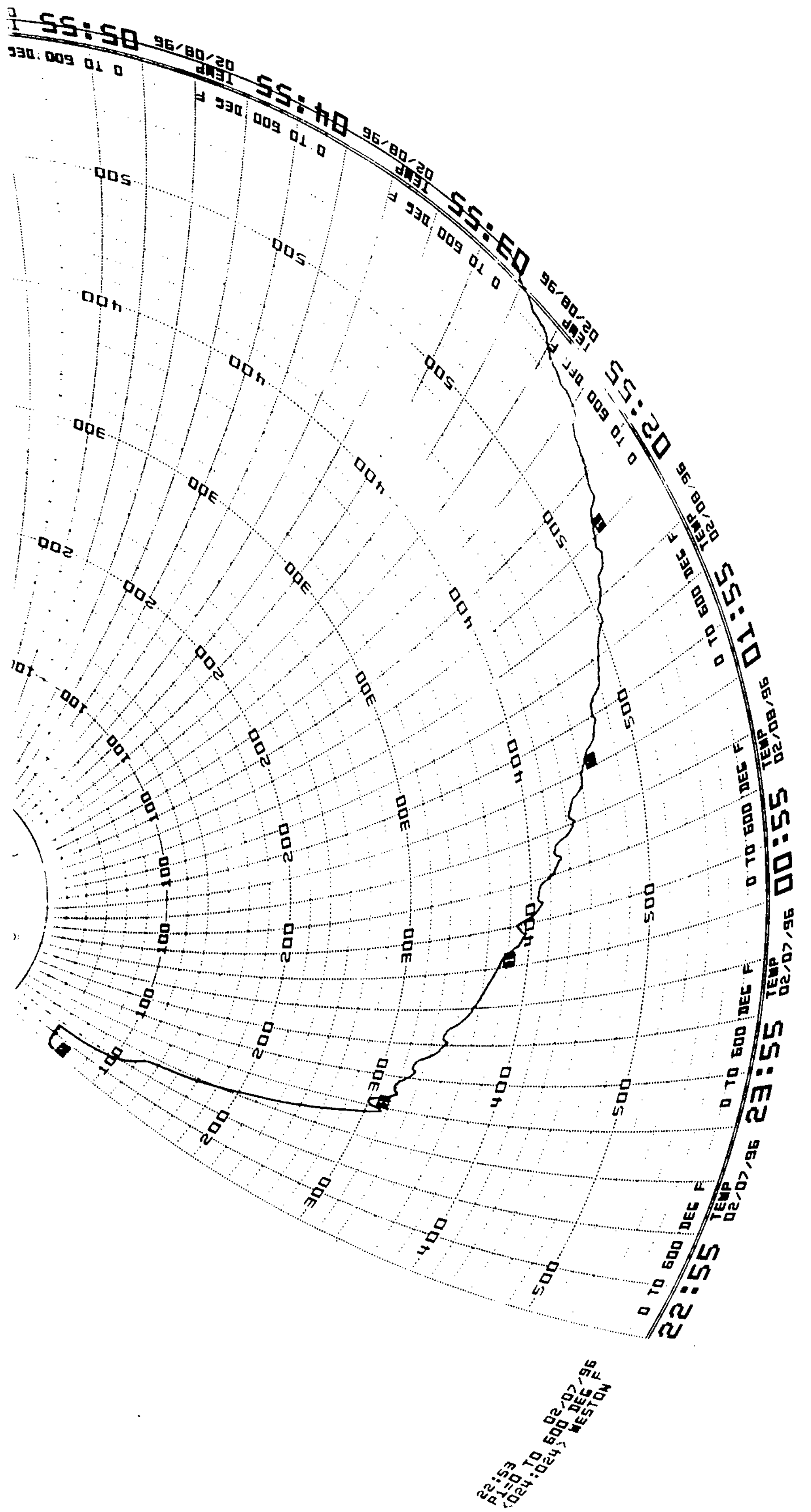
Date:	8 FEB 96
Time:	
Test Number:	# 5
Ramp-Up Rate:	75° F/hr
Soak Time:	4 hrs
Soak Temp:	600°F

Tag	Description	Unit	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000
FURNACE												
PIT-232	Fuel Gas Pressure	In.WC	11.30	11.58	11.88	12.14	11.95	11.69	11.51	11.26	10.3	8.17
FIT-231	Fuel Gas Flow	CFH	90	105	121	135	121	115	110	105	82	37
PIT-222	Combustion Air Pressure	In.WC	25.23	25.31	25.37	25.43	25.43	25.35	25.20	24.88	24.2	23.67
FIT-221	Combustion Air Flow	CFH	10391	10303	10203	10175	10213	10235	10261	10369	10423	10852
PIT-158	Chamber Pressure	In.WC	-0.25	-.25	-.25	-.23	-.21	-.44	-.44	-.46	-.40	-.41
TIT-201	Recorder Temperature	Deg.F	378	455	527	601	626	625	618	614	456	234
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	381	459	531	605	629	627	621	617	442	235
TIT-203	Material Thermocouple #1	Deg.F	401	479	553	630	656	648	643	640	270	220
TIT-204	Material Thermocouple #2	Deg.F	312	379	442	509	547	559	561	562	280	239
TIT-205	Material Thermocouple #3	Deg.F	334	410	480	558	587	580	586	595	283	243
TIT-206	Material Thermocouple #4	Deg.F	355	430	503	578	617	620	614	613	303	253
TIT-207	Material Thermocouple #5	Deg.F	414	496	575	658	667	654	655	653	281	254
AFTERBURNER												
TIT-131	Combustor Burner Temp. Control	Deg. F	1818	1805	1809	1798	1827	1837	1838	1826	1820	1804
FIT-149	Fumes Flow ACFH	~~CFM~~	2210	2246	2352	2318	2199	2073	2116	2081	3106	2913
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.42	0.42	0.47	0.42	0.37	0.30	0.28	.27	.87	.99
TIT-145	Combustor Temperature	Deg. F	1818	1812	1816	1830	1806	1805	1821	1831	1822	1806
PIT-133	Fuel Pressure	PSIG	0.16	0.13	0.13	0.08	0.10	0.17	0.13	.08	.42	.76
TIT-121	Fuel Gas Flow CFH	~~GPM~~	607	595	582	481	492	513	579	462	731	1043
CEM												
NOx-B	Interconnecting Duct NOx	ppm	0.7	1.1	1.4	2.05	2.5	2.1	2.1	2.0	1.0	.6
THC-B	Interconnecting Duct THC	ppm	-30.7	-31.0	-31.0	-31.3	-31.6	-31.7	-30.4	-30.3	-30.4	-30.4
CO	Stack's CO	ppm	0.0	0.0	-0.5	0.0	0.0	0.0	0.0	-.5	0.0	0.0
THC	Stack's THC	ppm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NOx	Stack's NOx	ppm	13.2	56.0	54.8	58.5	37.0	4.0	79.6	71.5	62.1	44.4
SO2	Stack SO2	ppm	5.5	5.0	4.5	4.5	4.0	3.5	4.0	3.0	2.9	2.5
O2	Stack's O2	%	11.07	11.40	11.30	10.25	13.05	12.40	12.70	11.05	11.00	12.43
CO2	Stack's CO2	%	6.24	6.07	6.0	6.66	6.52	5.28	6.42	7.00	5.80	5.36
TIT-300	Ambient Temp	Deg. F		36			36		43.2		55.	
Weather Service	Relative Humidity			79.7			95.1		78.4		79.3	



Test Run 5
75°F /hr ramp
4 hr soak
600°F soak temp.

1



22:55 02/07/96 TEMP 0 TO 600 DEG F
23:55 02/07/96 TEMP 0 TO 600 DEG F
00:55 02/08/96 TEMP 0 TO 600 DEG F
01:55 02/08/96 TEMP 0 TO 600 DEG F
02:55 02/08/96 TEMP 0 TO 600 DEG F
03:55 02/08/96 TEMP 0 TO 600 DEG F
04:55 02/08/96 TEMP 0 TO 600 DEG F
05:55 02/08/96 TEMP 0 TO 600 DEG F
100
200
300
400
500
22:53 TO 02/07/96
P1=0 TO 600 DEG F
<024:024> WESTON

Test Number: #6
Ramp-Up Rate: 75°/Hr
Soak Time: 2 Hrs
Soak Temp: 600°

Pre - START-UP (1 of 3)

Date: 12 FEB
Time: 0030

MECHANICAL

Initial each item.

- [KDK] **Inspection doors/manways are SECURED**
- [KDK] **Gas Valves OPEN**
- [KDK] **View/Inspection Ports CLOSED**
- [77%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc have been returned to a position capable of sustaining system operations

ELECTRICAL

Initial each item.

- [TLB] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [TLB] **Furnace and Afterburner Control Breakers are ON.**
- [TLB] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [TLB] **BUMP Motors and switch to "AUTO"**
  - ____ *Furnace Combustion Blower (M-220)*
  - ____ *Afterburner Combustion Blower (M-130)*
  - ____ *Afterburner I.D Fan (M-158)*
  - ____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [JH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	70	Y
✓ Interconnecting Duct - THC	50.2	50	Y
✓ Stack NOx	75.6	70	N
✓ Stack SO2	126.4	127	N
✓ Stack THC	50.2	50	Y
✓ Stack CO	243.2	239	Y
✓ Stack O2	11.94	11.4	Y
✓ Stack CO2	9.92	9.9	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [TLB] **Datalogger/Computer is ON**
  - ____ *Record Time (Computer Clock)*
  - ____ *Record Ambient Temperature (TIT-300)*
  - ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

- [ ] **Pre - Spike Activities**
  - ____ *Lock-out all Motors: Complete Exclusion Log*
  - ____ *Secure Equipment Pad and Access Road w/ Chains*
  - ____ *Spike Test Materials and Furnace Test Plates*

	Test Number: #6
LOADING/UNLOADING (2 of 3)	Ramp-Up Rate:
Date:	Soak Time:
Time:	Soak Temp:

FIELD ACTIVITIES

Initial each item.

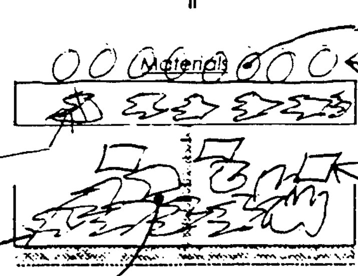
☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LBS

TOTAL 1501

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEBRIS 367 LBS	366 LBS		8 PCS PIPE 78 LBS	[illegible]
ROCK DEBRIS 367 LBS	343 LBS		CINDER BLOCK 89 LBS	86 LBS



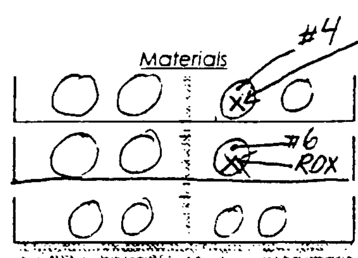
**** Secure pipe to prevent pipes from rolling**

Take Pictures

#2 Rack B's Characteristics.

TOTAL 1496

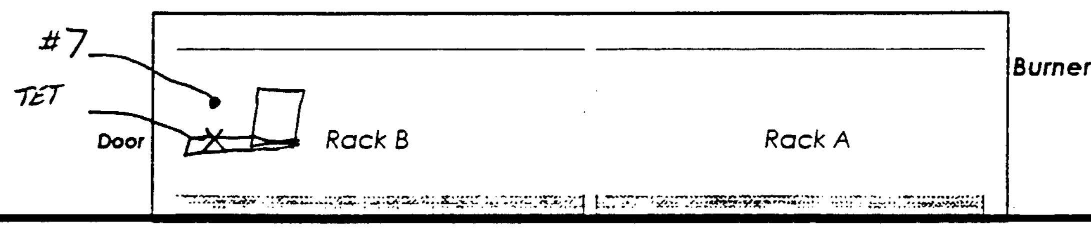
Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
RACK 430	430 LBS		CLAY PIPE 205 LBS	205 LBS
5" STEEL PIPE 240 LBS	240 LBS		CINDER BLOCK 611 LBS	616 LBS



Take Pictures

**** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Kevin J. Kleinfelter
Mathew Mulley

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

Test #6

START-UP (3 of 3)

Date: ____________

Time: ____________

Rmp-Up Time: ____________

Soak Time: ____________

Soak Temp: ____________

AFTERBURNER START-UP

Initial and record time for each item.

- Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC
- Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC
- Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC

Once the burner has started, the control system will initiate a purge sequence. The pilot will then attempt to light the burner at low fire.

- Start "DATALOGGER" Pushbuttons on the Computer.
- Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC

@ 600 F: ________ :Time

@ 1200 F: ________ :Time

@ 1800F: ________ :Time

Once the burner is at low fire, burner control will be released to the operator. The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- Set Bleed Air Damper to 75%
- Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC
- Set Controller to "MANUAL". Set controller output to 0.0
- Turn Furnace Key to "BURNER" Position.
- Verify "INTERLOCK OK" Light is energized.

Once the burner started, the control system will initiate a purge sequence. The pilot will then attempt to light the burner at low fire.

- Open Bleed Air Valve to 100%
- Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- Manually Log Operating Parameters.

Use the attached Log Sheet to record all operating parameters at least hourly. SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.
- STOP "OXIDIZER" and "AIR BLOWER"
- STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.

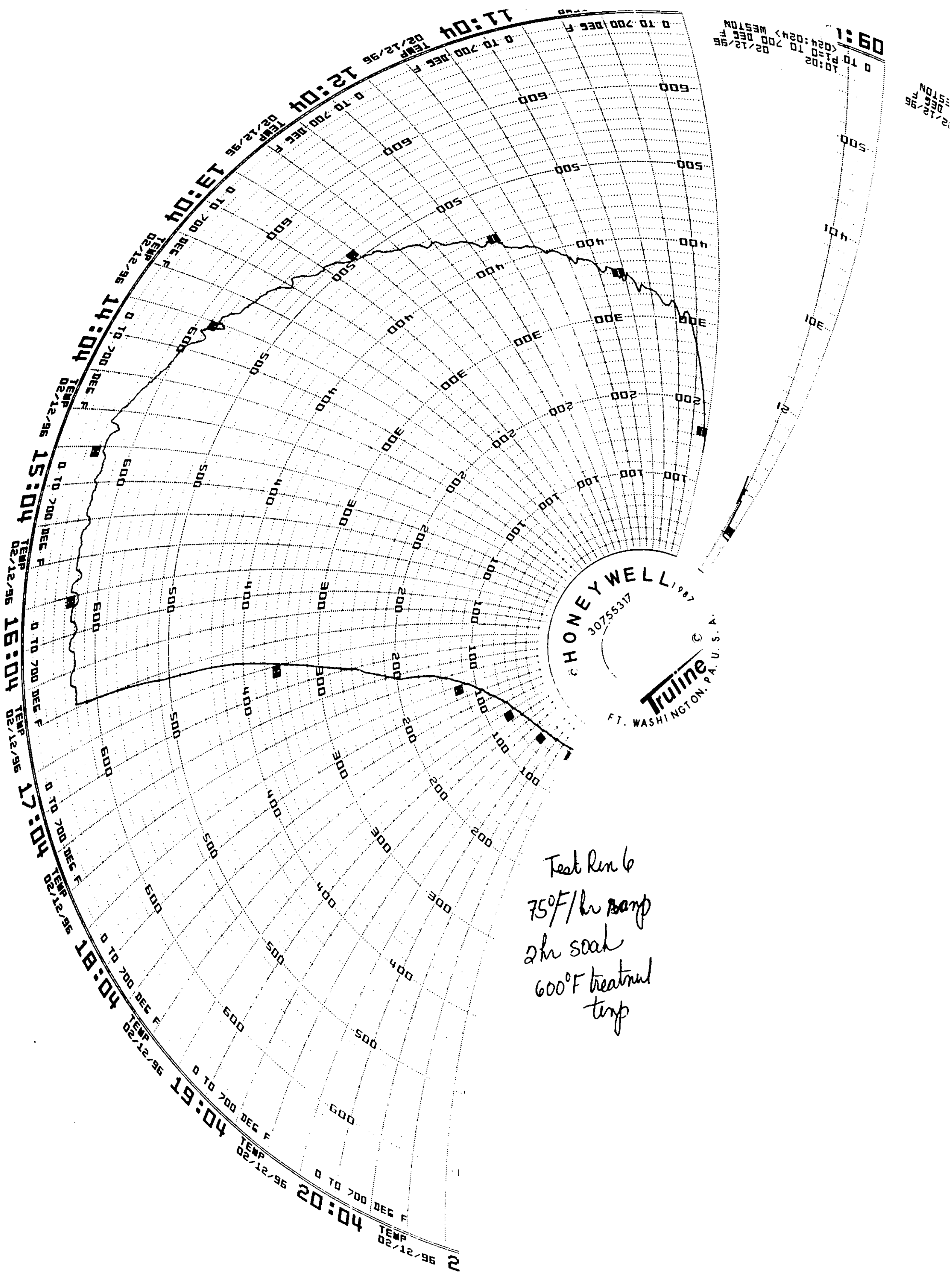
***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

Date: 12 FEB 96
Time:

Test Number: #6
Ramp-Up Rate: 75°F hr
Soak Time: 2 hr.
Soak Temp: 600°F

Tag	Description	Unit	0900	1000	1100	1200	1300	1400	1500	1600	1700
FURNACE											
PIT-232	Fuel Gas Pressure	In.WC	3.73	7.34	10.85	11.11	11.29	11.37	11.32	11.34	3.96
FIT-231	Fuel Gas Flow	CFH	-1	1	86	98	114	121	119	119	-1
PIT-222	Combustion Air Pressure	In.WC	23.68	24.17	24.79	24.67	24.47	24.66	24.61	24.79	23.37
FIT-221	Combustion Air Flow	CFH	12200	11220	10302	10244	10105	10133	10173	10184	12088
PIT-158	Chamber Pressure	In.WC	-0.36	-0.35	-0.33	-0.26	-0.28	-0.45	-0.51	-0.49	-0.19
TIT-201	Recorder Temperature	Deg.F	42	92	338	412	485	557	631	632	422
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	42	96	341	416	489	563	635	636	415
TIT-203	Material Thermocouple #1	Deg.F	43	76	286	362	433	508	607	625	488
TIT-204	Material Thermocouple #2	Deg.F	42	76	312	379	454	533	619	613	414
TIT-205	Material Thermocouple #3	Deg.F	48	44	270	359	438	516	591	604	550
TIT-206	Material Thermocouple #4	Deg.F	43	94	274	337	398	468	537	544	370
TIT-207	Material Thermocouple #5	Deg.F	42	106	366	445	524	593	655	662	467
AFTERBURNER											
TIT-131	Combustor Burner Temp. Control	Deg. F	1807	1807	1806	1813	1804	1819	1827	1830	1810
FIT-148	Fumes Flow	PPH SFM	2375	2297	2323	2349	2421	2284	2232	2185	2503
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.51	0.49	0.44	0.52	0.47	0.36	0.32	0.31	0.62
TIT-145	Combustor Temperature	Deg. F	1813	1815	1810	1822	1807	1816	1803	1837	1821
PIT-133	Fuel Pressure	PSIG	0.84	0.71	0.46	0.63	0.17	0.09	0.11	0.04	0.16
TIT-121	Fuel Gas Flow	CFH GPM	1161	987	765	738	662	525	341	603	606
CEM											
NOx-B	Interconnecting Duct NOx	ppm	-0.4	-0.1	20.9	1.1	2.0	3.0	3.4	2.8	-0.1
THC-B	Interconnecting Duct THC	ppm	36.8	57.7	42.1	38.3	48.7	30.6	27.4	32.1	4.5
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THC.	Stack's THC	ppm	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
NOx	Stack's NOx	ppm	62.7	57.2	83.0	68.3	70.3	69.2	77.1	99.3	98.6
SO2	Stack SO2	ppm	-0.5	-0.5	0.0	0.8	0.0	0.5	0.0	0.0	0.0
	Stack's O2	%	11.63	12.68	12.8	12.3	12.45	11.82	12.72	10.67	15.27
CO2	Stack's CO2	%	5.32	0.72	0.84	0.76	0.80	0.82	0.94	0.88	0.58
TIT-300	Ambient Temp	Deg. F	39°				45°			48	
Weather Service	Relative Humidity		52%				43.7			37.8	



Test Run 6
75°F/hr ramp
2hr soak
600°F treatment
temp

Pre - START-UP (1 of 3)

Date: 13 FEB 96

Time:

Test Number: #7

Ramp-Up Rate: 100°F/hr

Soak Time: 1hr

Soak Temp: 600°F

MECHANICAL

Initial each item.

KLK **Inspection doors/manways are SECURED**

KLK **Gas Valves OPEN**

KLK **View/Inspection Ports CLOSED**

KLK **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

TLB **All Lockout/Tagouts (1-5) are ACCOUNTED.**

KLB **Furnace and Afterburner Control Breakers are ON.**

KLB **Verify Emergency Pushbuttons are NOT ENGAGED.**

KLB **BUMP Motors and switch to "AUTO"**

- ____ *Furnace Combustion Blower (M-220)*
- ____ *Afterburner Combustion Blower (M-130)*
- ____ *Afterburner I.D Fan (M-158)*
- ____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

KLK **Calibrate CEM**

		Tank Values	Recorded Values	Adjustment (Y/N)
✓	*Interconnecting Duct - NOx*	75.6	75	N
✓	*Interconnecting Duct - THC*	30.4	30	Y
✓	*Stack NOx*	75.6	75	—
—	*Stack SO2*	126.4 ~~226~~	~~230~~ 126	
✓	*Stack THC*	30.4	30	Y
✓	*Stack CO*	123.6	123	Lettens
✓	*Stack O2*	5.97	6	Y
✓	*Stack CO*	123.6	123	Lettens

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

KLK **Datalogger/Computer is ON**

- ____ *Record Time (Computer Clock)*
- ____ *Record Ambient Temperature (TIT-300)*
- ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

☐ **Pre - Spike Activities**

- KLK *Lock-out all Motors; Complete Exclusion Log*
- KLK *Secure Equipment Pad and Access Road w/ Chains*
- KLK *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: ____________________

Time: ____________________

Test Number ____________________

Ramp-Up Rate: ____________________

Soak Time: ____________________

Soak Temp: ____________________

FIELD ACTIVITIES

Initial each item.

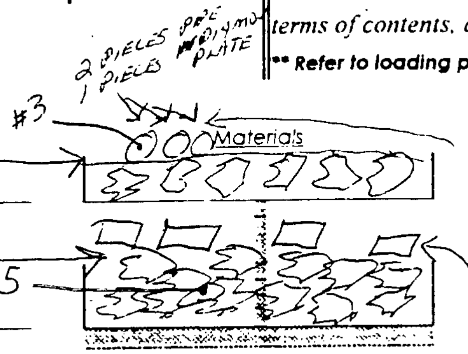
☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for Instructions.**

#1 Rack A's Characteristics. 600 LBS

TOTAL BEFORE 1500 LBS

TOTAL AFTER 1456



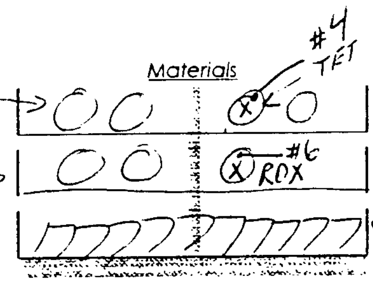
Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEB 367 LBS	362 LBS	STEEL PIPE 73 LBS	73 LBS
ROCK DEBRIS 367 LBS	354 LBS	CINDER BLOCK 93 LBS	93 LBS

**** Secure pipe to prevent pipes from rolling**

Take Pictures

#2 Rack B's Characteristics. 430 LBS

TOTAL BEFORE ~~1500~~ 1501 AFTER 1501

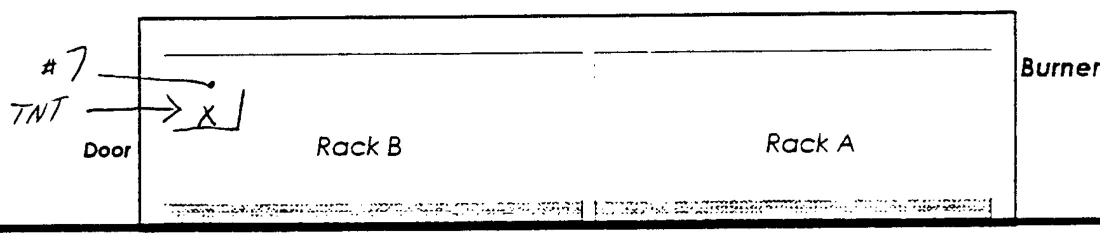


Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
5" STL PIPE 240 LBS	240 LBS		
CLAY PIPE 205 LBS	205 LBS	CINDER BLOCK 626 LBS	626 LBS

Take Pictures

** ***SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

[signature]

[signature]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: 13 FEB 96
Time:

Rmp-Up Time:
Soak Time:
Soak Temp:

AFTERBURNER START-UP

Initial and record time for each item.

- [x] TLB **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [x] TLB **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [x] TLB **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [x] TLB **Start "DATALOGGER" Pushbuttons on the Computer.**
- [x] TLB **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ____ :Time
@ 1200 F: ____ :Time
@ 1800F: ____ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature
1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- [x] TLB **Set Bleed Air Damper to 75%**
- [x] TLB **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [x] TLB **Set Controller to "MANUAL". Set controller output to 0.0**
- [x] TLB **Turn Furnace Key to "BURNER" Position.**
- [x] TLB **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [x] TLB **Open Bleed Air Valve to 100%**
- [ ] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- [x] TLB **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [x] KZ **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ ] **STOP "OXIDIZER" and "AIR BLOWER"**
- [ ] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (__ of __)

Date: 13 FEB 96

Time:

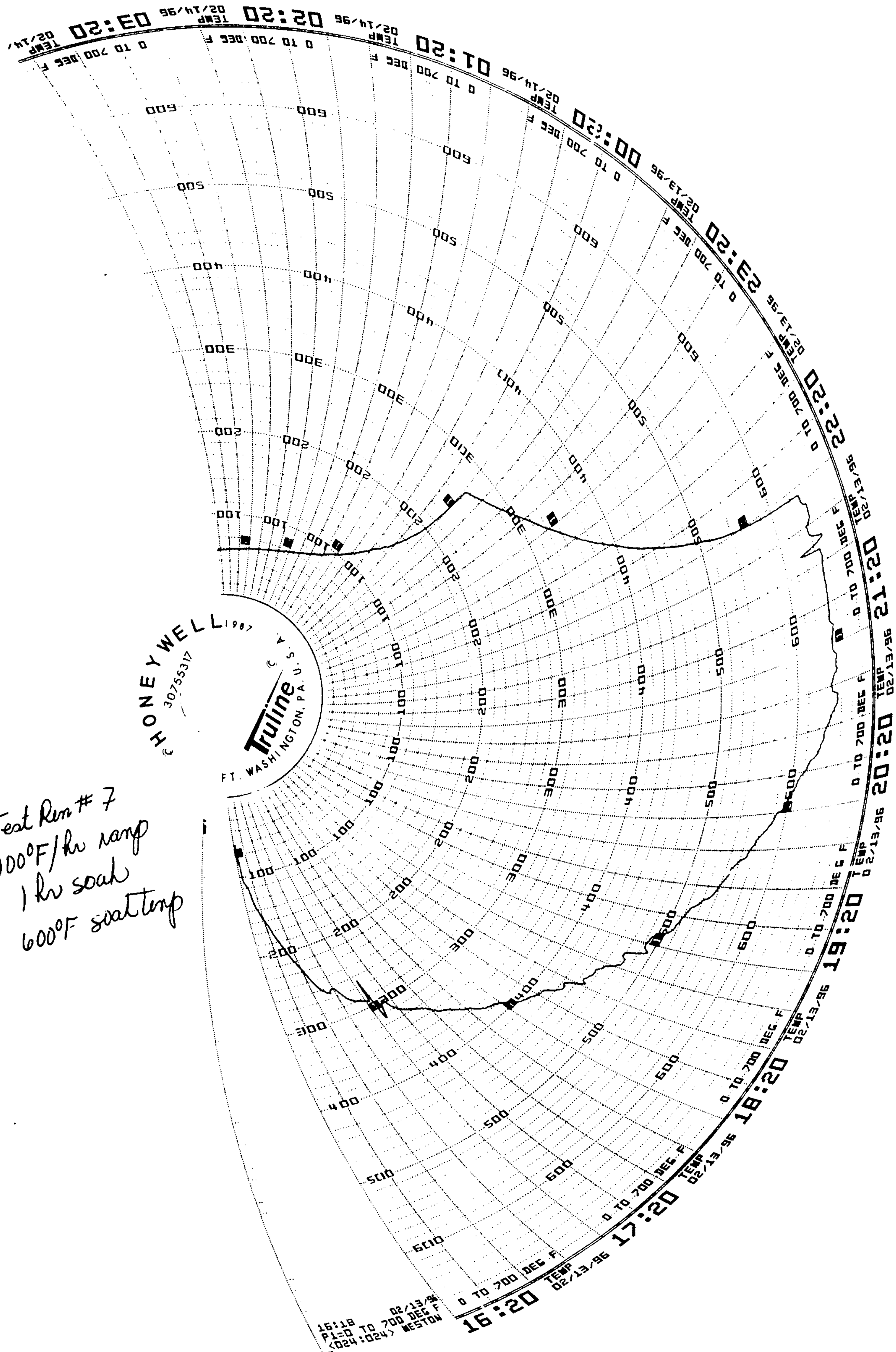
Test Number: ~~II~~ 7

Ramp-Up Rate: 100°F/hr.

Soak Time: 1 hr.

Soak Temp: 600°F

Tag	Description	Unit	1700	1800	19:00	2000	2100	2200	2300	2400
FURNACE										
PIT-232	Fuel Gas Pressure	In.WC	10.33	10.81	11.25	11.29	11.66	11.37	8.81	8.72
FIT-231	Fuel Gas Flow	CFH	76	86	109	117	136	111	40	41
PIT-222	Combustion Air Pressure	In.WC	24.17	24.58	24.64	24.57	24.74	24.85	24.38	24.30
FIT-221	Combustion Air Flow	CFH	10311	10261	10197	10145	10102	10202	10867	10867
PIT-158	Chamber Pressure	In.WC	-0.30	-0.27	-.37	-.52	-.45	-.44	-.22	-.27
TIT-201	Recorder Temperature	Deg.F	243	349	450	549	650	640	383	285
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	247	352	452	554	654	643	382	286
TIT-203	Material Thermocouple #1	Deg.F	166	311	409	515	614	631	442	319
TIT-204	Material Thermocouple #2	Deg.F	200	320	430	539	638	644	380	299
TIT-205	Material Thermocouple #3	Deg.F	134	219	298	368	444	506	424	337
TIT-206	Material Thermocouple #4	Deg.F	195	291	376	477	575	571	316	231
TIT-207	Material Thermocouple #5	Deg.F	281	387	488	589	689	672	409	311
AFTERBURNER										
TIT-131	Combustor Burner Temp. Control	Deg. F	1770	1828	1842	1799	1762	1848	1832	1791
FIT-149	Fumes Flow	pph ~~CFM~~	2354	2283	2185	2123	2089	2080	2432	2502
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.47	0.44	0.40	.29	.28	.27	.56	.66
TS125 CONTROLLER? TIT-145	Combustor Temperature	Deg. F	~~1055~~ 1797	1862	1775	1865	1860	1830	1826	1798
PIT-133	Fuel Pressure	PSIG	0.58	0.44	0.26	.11	.10	.08	.27	.59
TIT-121	Fuel Gas Flow	CFH ~~CFM~~	877	713	430	338	282	236	413	868
CEM										
NOx-B	Interconnecting Duct NOx	ppm	-0.9	-0.3	0.9	1.4	2.5	1.4	-1.2	-1.3
THC-B	Interconnecting Duct THC	ppm	39.0	42.5	39.2	32.1	26.9	34.9	69.3	67.0
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
THC	Stack's THC	ppm	-1.3	-1.3	-1.4	-1.5	-1.4	-1.5	-1.5	-1.4
NOx	Stack's NOx	ppm	49.0	48.1	44.3	59.7	32.3	31.5	59.3	55.5
SO2	Stack SO2	ppm	2.0	1.0	1.5	1.0	1.5	1.5	1.5	1.5
O2	Stack's O2	%	11.20	11.68	9.53	9.27	12.80	14.00	14.48	11.88
CO2	Stack's CO2	%	6.80	6.50	8.32	9.20	4.66	4.44	6.58	6.22
TIT-300	Ambient Temp	Deg. F	52°			45.8		44.4		45.5
Weather Service	Relative Humidity		34%			47.5		52.8		56.0



Test Run # 7
100°F/hr ramp
1 hr soak
600°F soak temp

Test Number:	#8
Ramp-Up Rate:	100°/Hr
Soak Time:	2 Hr
Soak Temp:	500°

Pre - START-UP (1 of 3)

Date: 14 FEB 96

Time: ________

MECHANICAL

Initial each item.

- [KK] **Inspection doors/manways are SECURED**
- [KK] **Gas Valves OPEN**
- [KK] **View/Inspection Ports CLOSED**
- [KK] **Record Gas (Propane) Valve Position** 74%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [KK] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [KK] **Furnace and Afterburner Control Breakers are ON.**
- [KK] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [KK] **BUMP Motors and switch to "AUTO"**
  - ✓ *Furnace Combustion Blower (M-220)*
  - ✓ *Afterburner Combustion Blower (M-130)*
  - ✓ *Afterburner I.D Fan (M-158)*
  - ✓ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [KH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	N
✓ Interconnecting Duct - THC	31.1	31	Y
✓ Stack NOx	75.6	75	N
✓ Stack SO2	126.4	126	N
✓ Stack THC	31.1	31	Y
✓ Stack CO	124.0	124.6	Y
✓ Stack O2	5.97	6.0	Y
✓ Stack CO	4.89	4.9	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [KK] **Datalogger/Computer is ON**
  - ____ *Record Time (Computer Clock)*
  - ____ *Record Ambient Temperature (TIT-300)*
  - ____ *Record Ambient Humidity (call Weather Service 564-3010 or 945-7000)*

- [ ] **Pre - Spike Activities**
  - ____ *Lock-out all Motors; Complete Exclusion Log*
  - ____ *Secure Equipment Pad and Access Road w/ Chains*
  - ____ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: 15 FEB 96

Time:

Test Number

Ramp-Up Rate:

Soak Time:

Soak Temp:

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.

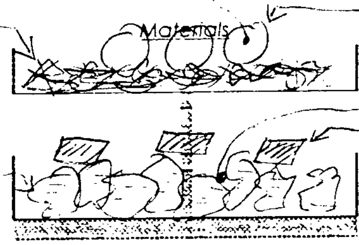
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics.
600 LBS

BEFORE 1500 LBS

AFTER 1483 LBS

Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)
STEEL DEB 367 LBS	367 LBS	#5	PIPE 57 LBS	56 LBS
ROCK DEB 367 LBS	351 LBS	#4	CONCRETE BLOCKS 109 LBS	109 LBS



**** Secure pipe to prevent pipes from rolling**

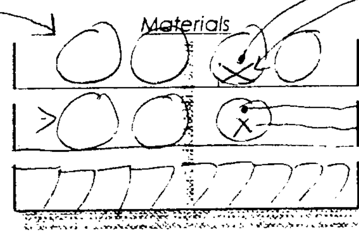
Take Pictures

#2 Rack B's Characteristics.

BEFORE 1501

AFTER 1501

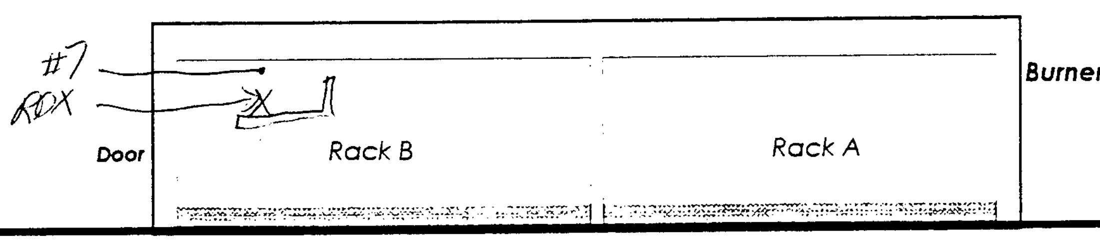
Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)
STEEL PIPE 240 LBS	240 LBS	#3 TET		
		#6 TNT		
CLAY PIPE 205 LBS	205 LBS		BLOCKS 626 LBS	626



Take Pictures

****** ***SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Matthew [signature]
Norm 2- [signature]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: 15 FEB 96
Time:

Rmp-Up Time:
Soak Time:
Soak Temp:

AFTERBURNER START-UP

Initial and record time for each item.

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time
@ 1200 F: ______ :Time
@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator. The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Open Bleed Air Valve to 100%**
- **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- **STOP "OXIDIZER" and "AIR BLOWER"**
- **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

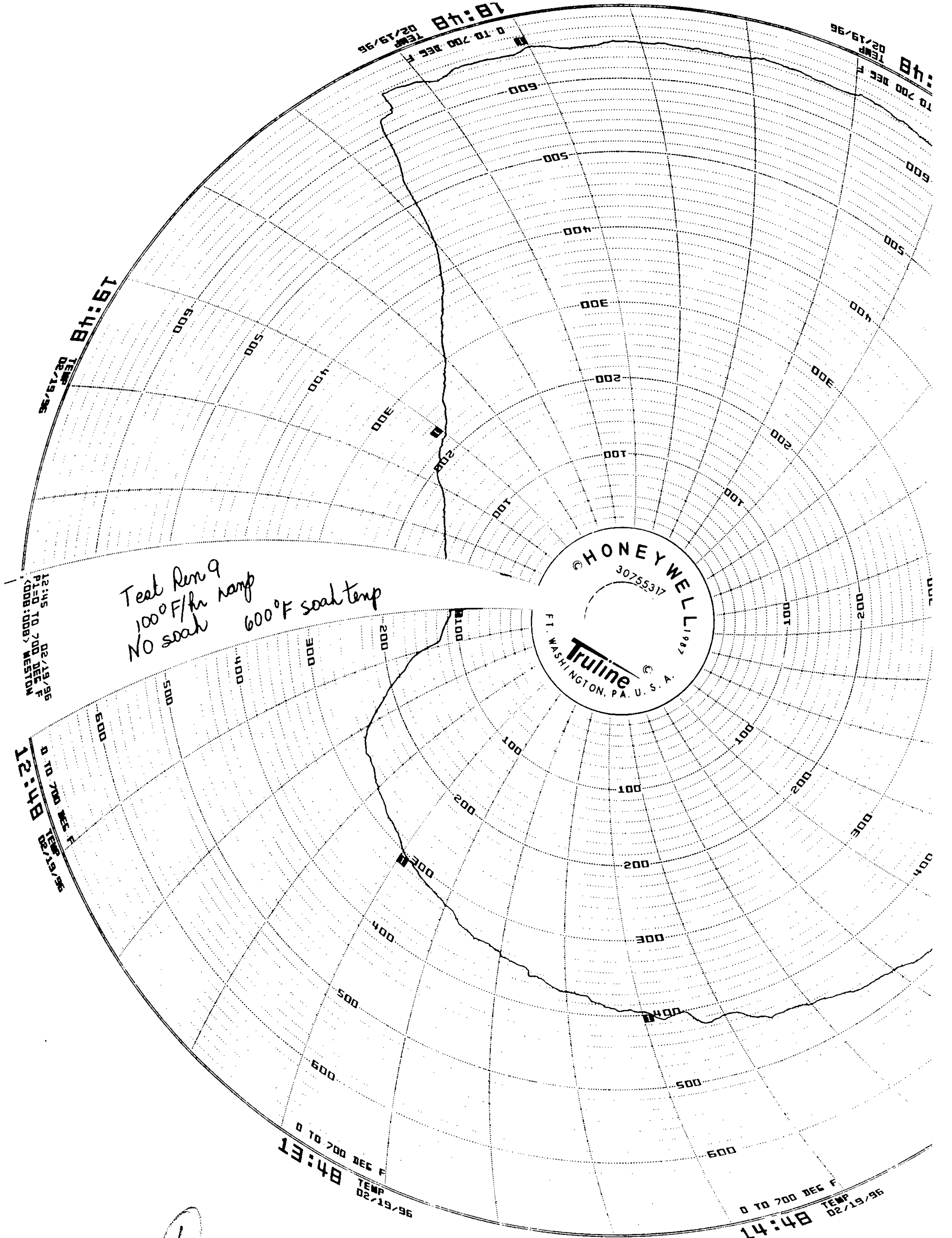
Test Number:	# 8
Ramp-Up Rate:	100 °F/hr
Soak Time:	2 hr
Soak Temp:	500 °F

HOURLY DATALOG (___ of ___)

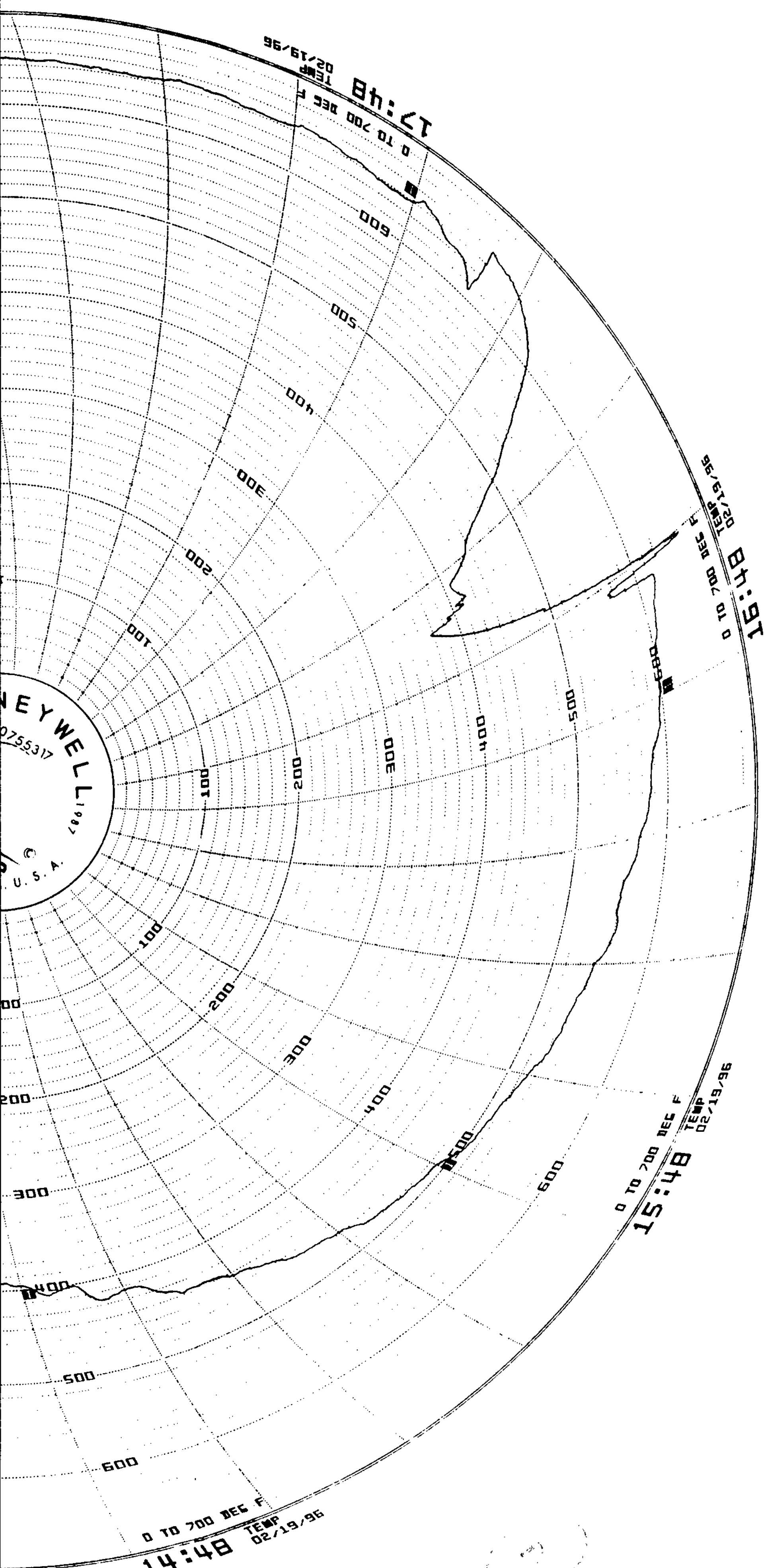
Date: 15 FEB. 96

Time:

Tag	Description	Unit	13:00	1400	1500	1600	1700	1800	1900
		Time:							
FURNACE									
PIT-232	Fuel Gas Pressure	In.WC	9.25	9.91	11.19	11.80	11.64	11.71	3.81
FIT-231	Fuel Gas Flow	CFH	67	79	90	114	99	97	-1
PIT-222	Combustion Air Pressure	In.WC	23.42	23.65	23.42	23.67	23.77	23.89	22.25
FIT-221	Combustion Air Flow	CFH	10342	10244	10764	10228	10739	10792	13032
PIT-158	Chamber Pressure	In.WC	-0.97	-.70	-.70	-0.61	-.058	-0.58	-.91
TIT-201	Recorder Temperature	Deg.F	221	344	432	544	550	546	143
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	225	347	437	548	553	550	143
TIT-203	Material Thermocouple #1	Deg.F	198	314	406	513	520	517	148
TIT-204	Material Thermocouple #2	Deg.F	158	248	313	401	440	456	210
TIT-205	Material Thermocouple #3	Deg.F	131	283	377	488	528	529	258
TIT-206	Material Thermocouple #4	Deg.F	158	285	368	471	489	485	174
FIT-207	Material Thermocouple #5	Deg.F	261	378	457	576	576	574	158
AFTERBURNER									
TIT-131	Combustor Burner Temp. Control	Deg. F	1829	1800	1806	1785	1829	1816	597
FIT-149	Fumes Flow	PPH ~~ACFM~~	2261	2142	2027	2003	1986	1994	4000
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.43	0.32	0.26	0.23	0.23	0.24	1.99
TIT-145	Combustor Temperature	Deg. F	1844	1862	1814	1848	1816	1830	532
PIT-133	Fuel Pressure	PSIG	0.60	0.43	0.35	0.43	0.52	0.34	.01
TIT-121	Fuel Gas Flow	CFH ~~SCFM~~	905	693	603	673	794	563	1
CEM									
NOx-B	Interconnecting Duct NOx	ppm	-0.2	0.2	0.9	1.8	1.0	0.9	-.8
THC-B	Interconnecting Duct THC	ppm	23.5	24.0	26.9	22.4	26.4	27.9	-2.2
CO	Stack's CO	ppm	-0.5	-0.5	-0.5	-0.5	-.05	-0.5	0.0
THC	Stack's THC	ppm	-4.6	-4.8	-4.7	-4.9	-4.9	-4.9	-3.8
NOx	Stack's NOx	ppm	51.5	47.5	56.9	62.2	75.1	56.0	-.7
SO2	Stack SO2	ppm	1.0	1.0	1.0	0.5	0.5	0.5	.5
O2	Stack's O2	%	11.52	11.72	11.00	10.45	9.77	11.73	20.45
CO2	Stack's CO2	%	6.02	5.90	5.68	6.72	7.25	5.86	-.06
TIT-300	Ambient Temp	Deg. F	57°	5	55°		48°		43.2°
Weather Service	Relative Humidity		50%		51%		62%		71.3%


HONEYWELL
30755317
Truline
FT. WASHINGTON, PA. U. S. A.
12:48
13:48
14:48
0 TO 700 DEG F
TEMP
02/19/96
12:45 02/19/96
P1=0 TO 700 DEG F
Test Run 9
100°F/hr ramp
NO soak 600°F soak temp

1


14:48
TEMP
02/19/96
0 TO 700 DEG F
15:48
TEMP
02/19/96
0 TO 700 DEG F
16:48
TEMP
02/19/96
0 TO 700 DEG F
17:48
TEMP
02/19/96
0 TO 700 DEG F
NEYWELL
0755317
1987
U.S.A.

Test Number: #9
Ramp-Up Rate: 100°/Hr
Soak Time: 0 hr 0 min
Soak Temp: 600°

Pre - START-UP (1 of 3)

Date: 19 FEB 96
Time:

MECHANICAL

Initial each item.

- [RZ] **Inspection doors/manways are SECURED**
- [RZ] **Gas Valves OPEN**
- [RZ] **View/Inspection Ports CLOSED**
- [75%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [RZ] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [RZ] **Furnace and Afterburner Control Breakers are ON.**
- [RZ] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [RZ] **BUMP Motors and switch to "AUTO"**
  - ✓ Furnace Combustion Blower (M-220)
  - ✓ Afterburner Combustion Blower (M-130)
  - ✓ Afterburner I.D Fan (M-158)
  - ✓ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [JH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	N
✓ Interconnecting Duct - THC	31.1	31	Y
✓ Stack NOx	75.6	75	Y
✓ Stack SO2	126.4	125	Y
✓ Stack THC	~~[illegible]~~ 31.1	31	Y
✓ Stack CO	~~[illegible]~~ 1240	124.0	Y
✓ Stack O2	5.97	6.0	Y
✓ Stack CO_2	~~[illegible]~~ 4.89	4.9	N

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [ ] **Datalogger/Computer is ON**
  - ____ Record Time (Computer Clock)
  - ____ Record Ambient Temperature (TIT-300)
  - ____ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

- [RZ] **Pre - Spike Activities**
  - ✓ Lock-out all Motors; Complete Exclusion Log
  - ✓ Secure Equipment Pad and Access Road w/ Chains
  - ✓ Spike Test Materials and Furnace Test Plates

LOADING/UNLOADING (2 of 3)

Date:
Time:

Test Number: #9
Ramp-Up Rate: 100°/Hr
Soak Time: 0 hrs
Soak Temp: 600°

FIELD ACTIVITIES

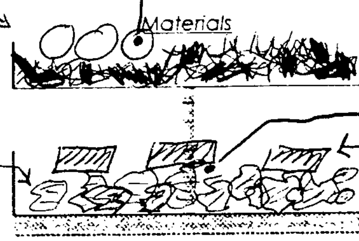
Initial each item.

#1 **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LBS

BEFORE 1500
AFTER 1481

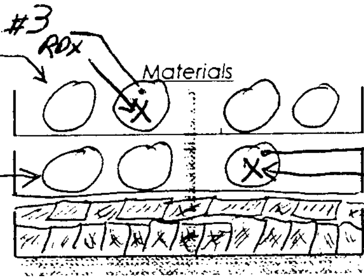


Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 100 LBS	96 LBS	STEEL DEB 367 LBS	367 LBS
CONCRETE DEB 367 LBS	350 LBS	CINDER BLOCK 66 LBS	66 LBS

** Secure pipe to prevent pipes from rolling

#2 Rack B's Characteristics. 430 LBS

BEFORE 1501 LBS
AFTER 1502

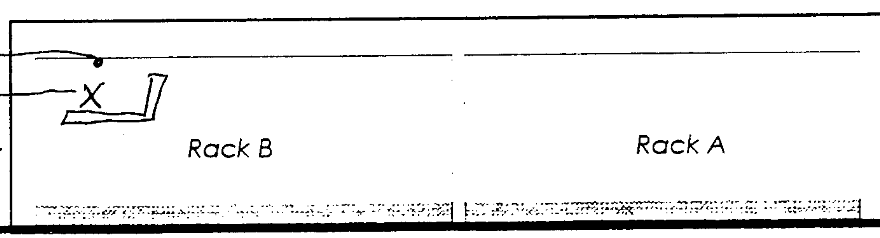


Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240 LBS	240 LBS		
CLAY PIPE 205 LBS	205 LBS	CINDER BLOCKS 626 LBS	626 LBS

** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**

#7
TET SPIKE



☐ **Roll Calls and Close Furnace Door**

[signature]
[signature]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: ______________________ **Rmp-Up Time:** ______________________

Time: ______________________ **Soak Time:** ______________________

Soak Temp: ______________________

AFTERBURNER START-UP

Initial and record time for each item.

- [x] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [x] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [x] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [x] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [x] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ____________ :Time

@ 1200 F: ____________ :Time

@ 1800F: ____________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [x] **Set Bleed Air Damper to 75%**
- [x] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [x] **Set Controller to "MANUAL". Set controller output to 0.0**
- [x] **Turn Furnace Key to "BURNER" Position.**
- [x] **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [x] **Open Bleed Air Valve to 100%**
- [x] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
  Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [x] **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [x] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [x] **STOP "OXIDIZER" and "AIR BLOWER"**
- [x] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (___ of ___)

Date: 19 FEB
Time:

Test Number: #9
Ramp-Up Rate: 100°F hr.
Soak Time: No SOAK TIME
Soak Temp: 600°F

Tag	Description	Unit	1300	1400	1500	1600	1700	1800	1900	2000
		Time:								
FURNACE										
PIT-232	Fuel Gas Pressure	In.WC	7.76	10.40	10.96	11.57		11.98	11.78	3.97
FIT-231	Fuel Gas Flow	CFH	1	77	87	107	M	138	122	-1
PIT-222	Combustion Air Pressure	In.WC	22.31	22.87	23.03	23.43	I	23.71	23.64	21.87
FIT-221	Combustion Air Flow	CFH	11653	10684	10708	10616	S	10536	10584	12859
PIT-158	Chamber Pressure	In.WC	-.34	-.32	-.57	-.49	S	-.53	-.58	-0.46
TIT-201	Recorder Temperature	Deg.F	120	312	421	509	E	644	647	212
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	121	315	424	512	D	649	651	211
TIT-203	Material Thermocouple #1	Deg.F	111	260	360	448		560	586	168
TIT-204	Material Thermocouple #2	Deg.F	80	195	282	346	R	483	522	296
TIT-205	Material Thermocouple #3	Deg.F	79	224	328	427	E	604	623	326
TIT-206	Material Thermocouple #4	Deg.F	112	273	364	440	A	565	572	186
TIT-207	Material Thermocouple #5	Deg.F	127	349	444	534	D	680	675	233
		AVE	102	260	356	439		579	596	241
AFTERBURNER										
TIT-131	Combustor Burner Temp. Control	Deg. F	1793	1791	1805	1783	I	1783	1807	1779
FIT-149	Fumes Flow	PPH ~~SCFM~~	2371	2309	2102	2027	N	2174	2036	3162
PIT-151	Fumes Pressure (Furnace Draft)	InWC	.48	.38	.28	.26	G	.30	.25	1.20
TIT-145	Combustor Temperature	Deg. F	1802	1770	1812	1798		1823	1822	1781
PIT-133	Fuel Pressure	PSIG	.67	.45	.40	.38		.35	.31	0.83
TIT-121	Fuel Gas Flow	CFH ~~SCFM~~	967	792	632	656		544	531	1101
CEM										
NOx-B	Interconnecting Duct NOx	ppm	-1.2	-.28	.3	1.9		2.0	1.4	-1.2
THC-B	Interconnecting Duct THC	ppm	100.0	58.1	94.2	94.8		73.0	71.7	0.2
CO	Stack's CO	ppm	-.5	-.5	-.5	-.5		-.5	-.5	-0.5
THC	Stack's THC	ppm	-.9	-.9	-.9	-.9		-1.1	-1.1	-1.1
NOx	Stack's NOx	ppm	45.3	47.9	54.3	61.9		48.6	45.6	39.7
SO2	Stack SO2	ppm	-1.0	-1.0	-1.0	-.5		0.0	0.0	0.5
[illegible]	Stack's O2	%	12.25	11.60	11.77	10.55		10.88	11.07	13.25
CO2	Stack's CO2	%	5.56	5.90	5.76	6.56		6.26	6.19	4.70
TIT-300	Ambient Temp	Deg. F	70.8	71.0	66.2	57.6		55.0		
Weather Service	Relative Humidity		54.5%	54.3	68.1%	99.9%		100.0%		

Pre - START-UP (1 of 3)

Date: 20 FEB 96

Time:

Test Number: #10

Ramp-Up Rate: 150°/Hr

Soak Time: 1 Hr

Soak Temp: 550°

MECHANICAL

Initial each item.

RJK **Inspection doors/manways are SECURED**

RJK **Gas Valves OPEN**

RJK **View/Inspection Ports CLOSED**

RJK **Record Gas (Propane) Valve Position** 71%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

RJK **All Lockout/Tagouts (1-5) are ACCOUNTED.**

RJK **Furnace and Afterburner Control Breakers are ON.**

RJK **Verify Emergency Pushbuttons are NOT ENGAGED.**

TJB **BUMP Motors and switch to "AUTO"**

____ *Furnace Combustion Blower (M-220)*

____ *Afterburner Combustion Blower (M-130)*

____ *Afterburner I.D Fan (M-158)*

____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

JH **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	Y
✓ Interconnecting Duct - THC	31.1	31	Y
✓ Stack NOx	75.6	75	N
✓ Stack SO2	126.4	126	Y
✓ Stack THC	31.1	31	Y
✓ Stack CO	124.0	124.6	N
✓ Stack O2	5.97	6.0	Y
✓ Stack CO2	4.89	4.9	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

TJB **Datalogger/Computer is ON**

____ *Record Time (Computer Clock)*

____ *Record Ambient Temperature (TIT-300)*

____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

RJK **Pre - Spike Activities**

____ *Lock-out all Motors; Complete Exclusion Log*

____ *Secure Equipment Pad and Access Road w/ Chains*

____ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: ~~22~~ FEB 96

Time:

Test Number: #10

Ramp-Up Rate: 150°/Hr

Soak Time: 1 Hr

Soak Temp: 550°

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.

***** Refer to loading procedures for instructions.***

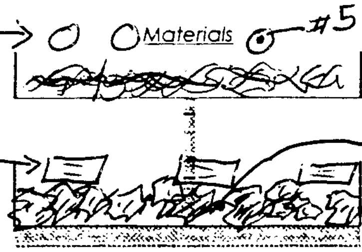
#1 Rack A's Characteristics.

RACK 600LB

BEFORE 1500

AFTER 1473

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 33 LBS	33 LBS	#5	STEEL DEB 367LBS	364LBS
CINDER BLOCK 133 LBS	128 LBS	#4	ROCK DEBRI 367LBS	348



**** Secure pipe to prevent pipes from rolling**

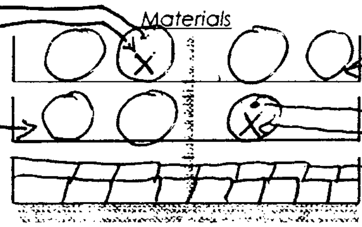
Take Pictures

#2 Rack B's Characteristics.

BEFORE 1501

AFTER 1501

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
		#3 TET	STEEL PIPE 240LBS	STEEL PIPE 240 LBS
		#6 RDX		
CLAY PIPE 205 LBS	CLAY PIPE 205 LBS		CINDER BLOCK 626 LBS	CINDER BLOC 627 LBS



Take Pictures

** ***SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***

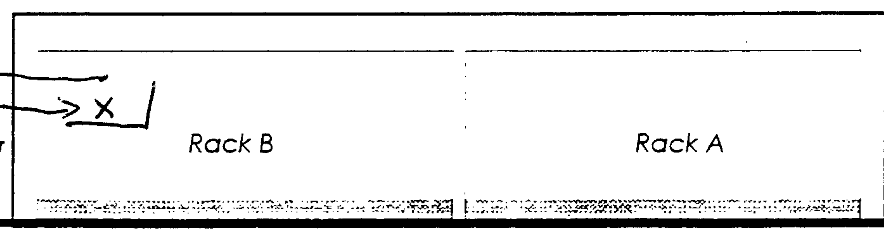
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris

Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**

#7

TNT



☐ **Roll Calls and Close Furnace Door**

Kevin D. Klingbird

Matthew Whalley

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

Test #10

START-UP (3 of 3)

Date: ______________________

Time: ______________________

Rmp-Up ~~Time~~ Rate: 150°/Hr

Soak Time: 1 Hr

Soak Temp: 550°

AFTERBURNER START-UP

Initial and record time for each item.

- [TB] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [TB] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [TB] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [TB] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [TB] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ____________ :Time

@ 1200 F: ____________ :Time

@ 1800F: ____________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [TB] **Set Bleed Air Damper to 75%**
- [TB] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [TB] **Set Controller to "MANUAL". Set controller output to 0.0**
- TB **Turn Furnace Key to "BURNER" Position.**
- TB **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [TB] **Open Bleed Air Valve to 100%**
- [TB] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [TB] **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [TB] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [TB] **STOP "OXIDIZER" and "AIR BLOWER"**
- TB **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

Date: 20 FEB. 96

Time:

Test Number: # 10

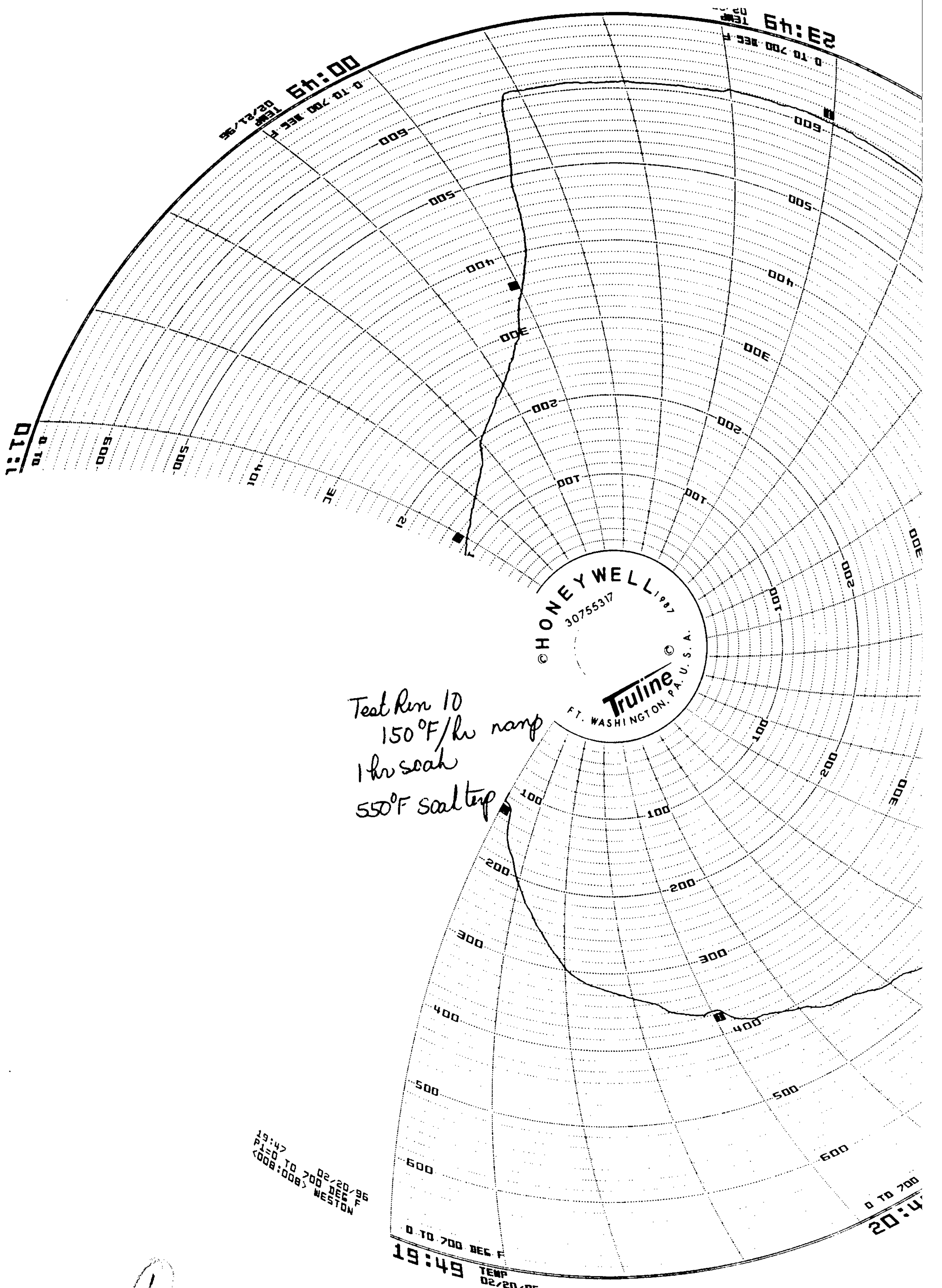
Ramp-Up Rate: 150 °F hr

Soak Time: 1 hr.

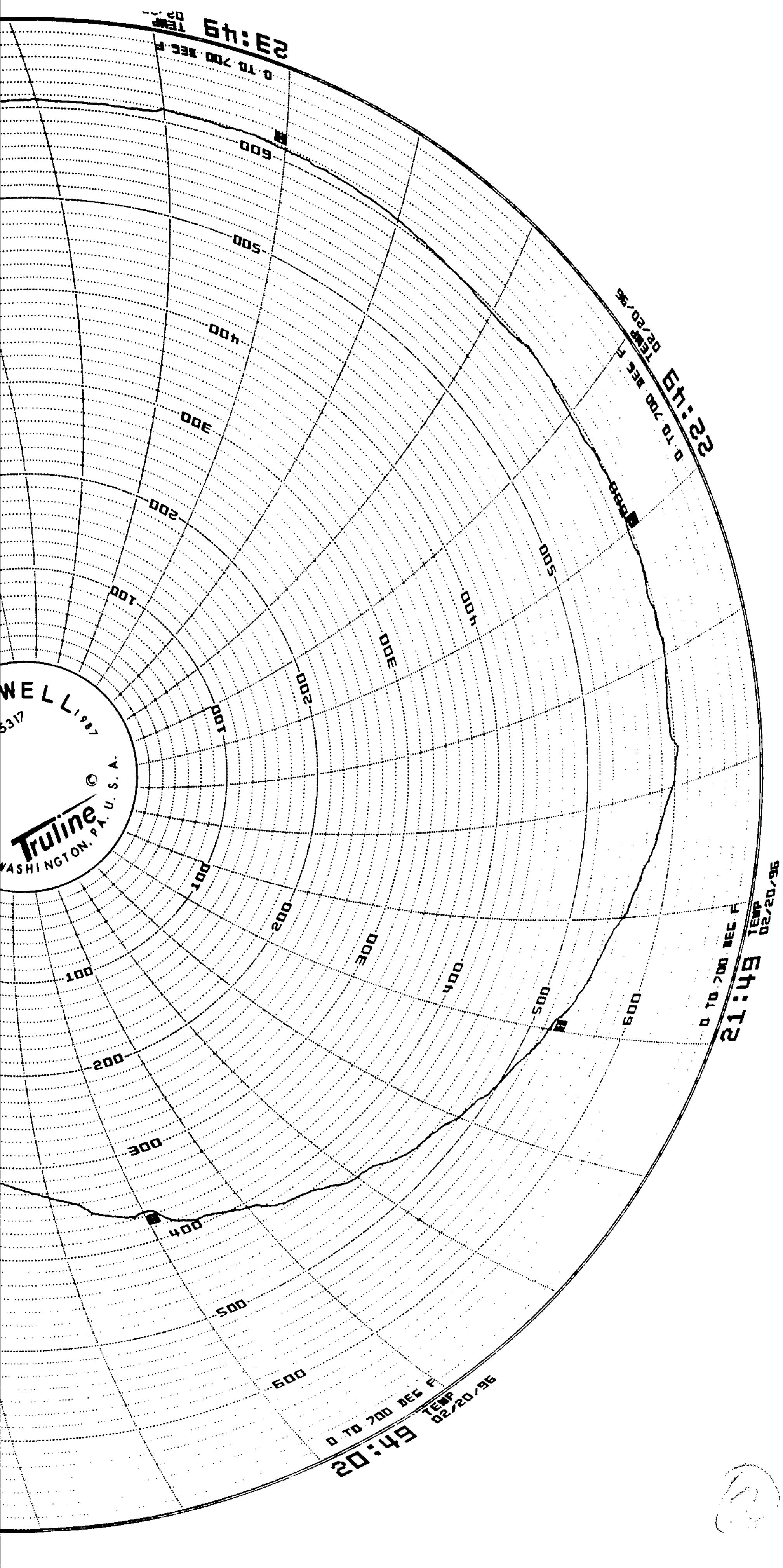
Soak Temp: 550 °F

21 FEB

Tag	Description		Unit	1900	2000	2100	2200	2300	2400	0100
			Time:							
FURNACE										
PIT-232	Fuel Gas Pressure		In.WC	4.30	10.41	12.12	12.69	12.63	12.44	4.21
FIT-231	Fuel Gas Flow		CFH	-1	56	103	133	122	113	-1
PIT-222	Combustion Air Pressure		In.WC	22.35	23.79	24.22	24.37	24.51	24.40	22.61
FIT-221	Combustion Air Flow		CFH	12948	11241	10753	10609	10697	10711	13639
PIT-158	Chamber Pressure		In.WC	-0.32	-0.43	-0.24	-0.22	-0.19	-0.24	-0.50
TIT-201	Recorder Temperature		Deg.F	58	154	381	535	597	611	287
TIT-202	Furnace Exit Gas Temp (Control)		Deg.F	58	158	384	540	600	612	282
TIT-203	Material Thermocouple #1		Deg.F	59	131	335	475	548	572	319
TIT-204	Material Thermocouple #2		Deg.F	61	93	351	363	418	460	340
TIT-205	Material Thermocouple #3		Deg.F	57	95	311	474	571	591	413
TIT-206	Material Thermocouple #4		Deg.F	58	129	313	447	507	531	238
TIT-207	Material Thermocouple #5		Deg.F	60	183	417	577	629	646	292
	AVE.			59	127	326	468	534	558	319
AFTERBURNER										
TIT-131	Combustor Burner Temp. Control		Deg. F	1653	1846	1803	1793	1832	1820	1776
FIT-149	Fumes Flow	PPH	CFM	2387	2322	2135	2172	2108	1994	3426
PIT-151	Fumes Pressure (Furnace Draft)		InWC	0.54	0.50	0.35	0.34	0.30	0.23	1.59
TIT-145	Combustor Temperature		Deg. F	1678	1853	1816	1842	1830	1833	1783
PIT-133	Fuel Pressure		PSIG	0.82	0.70	0.48	0.42	0.32	0.29	0.81
TIT-121	Fuel Gas Flow	CFH	CFM	11.03	979	717	620	522	467	1095
CEM										
NOx-B	Interconnecting Duct NOx		ppm	-0.4	-0.2	1.3	3.0	2.3	2.2	-0.1
THC-B	Interconnecting Duct THC		ppm	5.2	100	100.0	91.9	96.9	100	4.7
CO	Stack's CO		ppm	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
THC	Stack's THC		ppm	-0.4	-1.2	-1.1	-1.2	-1.2	-1.3	-1.3
NOx	Stack's NOx		ppm	-0.5	44.4	51.2	48.8	43.4	49.5	46.8
SO2	Stack SO2		ppm	2.0	3.5	3.0	3.5	4.8	4.5	4.0
O2	Stack's O2		%	-0.20	11.70	11.42	11.23	11.98	12.07	13.32
CO2	Stack's CO2		%	-0.14	11.70	6.14	6.24	5.78	5.72	4.58
TIT-300	Ambient Temp		Deg. F		49°	44°	44°		42°	
Weather Service	Relative Humidity				99	99	99%		99%	


Test Run 10
150°F/hr ramp
1 hr soak
550°F soak temp
19:47 02/20/96
P1=0 TO 700 DEG F
<008:008> WESTON
0 TO 700 DEG F
19:49 TEMP 02/20/96
HONEYWELL 1987
30755317
Truline
FT. WASHINGTON, PA. U.S.A.

1



Truline
WASHINGTON, PA. U.S.A.
1987
0 TO 700 DEG F
TEMP
02/20/96
20:49
21:49
22:49
23:49
100
200
300
400
500
600

Pre - START-UP (1 of 3)

Date: 22 FEB 96
Time: ______

Test Number: #11
Ramp-Up Rate: 150 °F/Hr.
Soak Time: 1 Hr.
Soak Temp: 400 °F

MECHANICAL

Initial each item.

[RJK] **Inspection doors/manways are SECURED**
[RJK] **Gas Valves OPEN**
[RJK] **View/Inspection Ports CLOSED**
[71%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

[RJK] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
[RJK] **Furnace and Afterburner Control Breakers are ON.**
[RJK] **Verify Emergency Pushbuttons are NOT ENGAGED.**
[RJK] **BUMP Motors and switch to "AUTO"**

- ____ *Furnace Combustion Blower (M-220)*
- ____ *Afterburner Combustion Blower (M-130)*
- ____ *Afterburner I.D Fan (M-158)*
- ____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[ ] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
____ *Interconnecting Duct - NOx*			
____ *Interconnecting Duct - THC*			
____ *Stack NOx*			
____ *Stack SO2*			
____ *Stack THC*			
____ *Stack CO*			
____ *Stack O2*			
____ *Stack CO*			

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[RJK] **Datalogger/Computer is ON**

- 1001 *Record Time (Computer Clock)*
- 71.1 *Record Ambient Temperature (TIT-300)*
- 67.4% *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

[RJK] **Pre - Spike Activities**

- ____ *Lock-out all Motors; Complete Exclusion Log*
- ____ *Secure Equipment Pad and Access Road w/ Chains*
- ____ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)	**Test Number**
Date: 22 FEB 96	**Ramp-Up Rate:**
Time:	**Soak Time:**
	Soak Temp:

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.

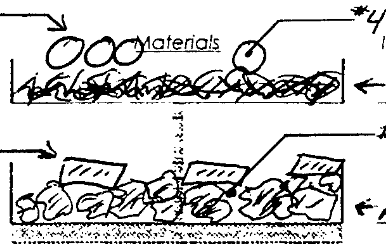
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LBS

BEFORE 1500

AFTER 1470

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
PIPE 66 LBS	63 LBS		← STEEL DEBRIS 367 LBS	371 LBS
CINDER BLOCK 100 LBS	98 LBS		← ROCK DEBRIS 367 LBS	354 LBS



**** Secure pipe to prevent pipes from rolling**

Take Pictures

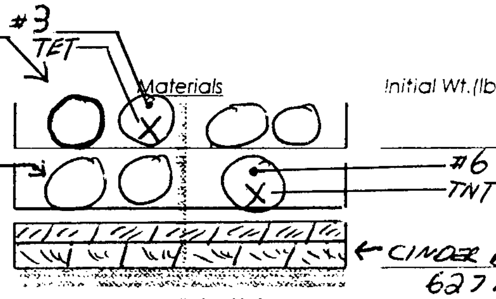
EMPTY RACK WT 354 LBS

#2 Rack B's Characteristics. 430 LBS

BEFORE 1501

AFTER ~~1470~~ 1501

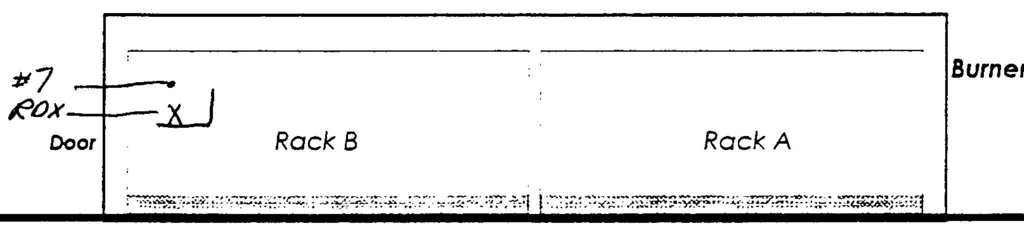
Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240 LBS	Steel Pipe 240#			
CLAY PIPE 205 LBS	Clay Pipe 205#		← CINDER BLOCK 627 LBS	Cinder Blocks 626 #



Take Pictures

**** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Kevin J. Klendint

Matthew Mullay

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

Date: ____________ Rmp-Up Time: ____________
Time: ____________ Soak Time: ____________
Soak Temp: ____________

AFTERBURNER START-UP

Initial and record time for each item.

- [RK] Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC
- [RK] Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC
- [RK] Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [RK] Start "DATALOGGER" Pushbuttons on the Computer.
- [RK] Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC

@ 600 F: ________ :Time
@ 1200 F: ________ :Time
@ 1800F: ________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [RK] Set Bleed Air Damper to 75%
- [RK] Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC
- [RK] Set Controller to "MANUAL". Set controller output to 0.0
- [RK] Turn Furnace Key to "BURNER" Position.
- [RK] Verify "INTERLOCK OK" Light is energized.

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [RK] Open Bleed Air Valve to 100%
- [RK] Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [RK] Manually Log Operating Parameters.

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

*** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS*

COOL-DOWN

Initial and record time for each item.

- [ ] Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.
- [ ] STOP "OXIDIZER" and "AIR BLOWER"
- [ ] STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.

*** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.*

HOURLY DATALOG (__ of __)

Date: 22 FEB 96

Time: ________

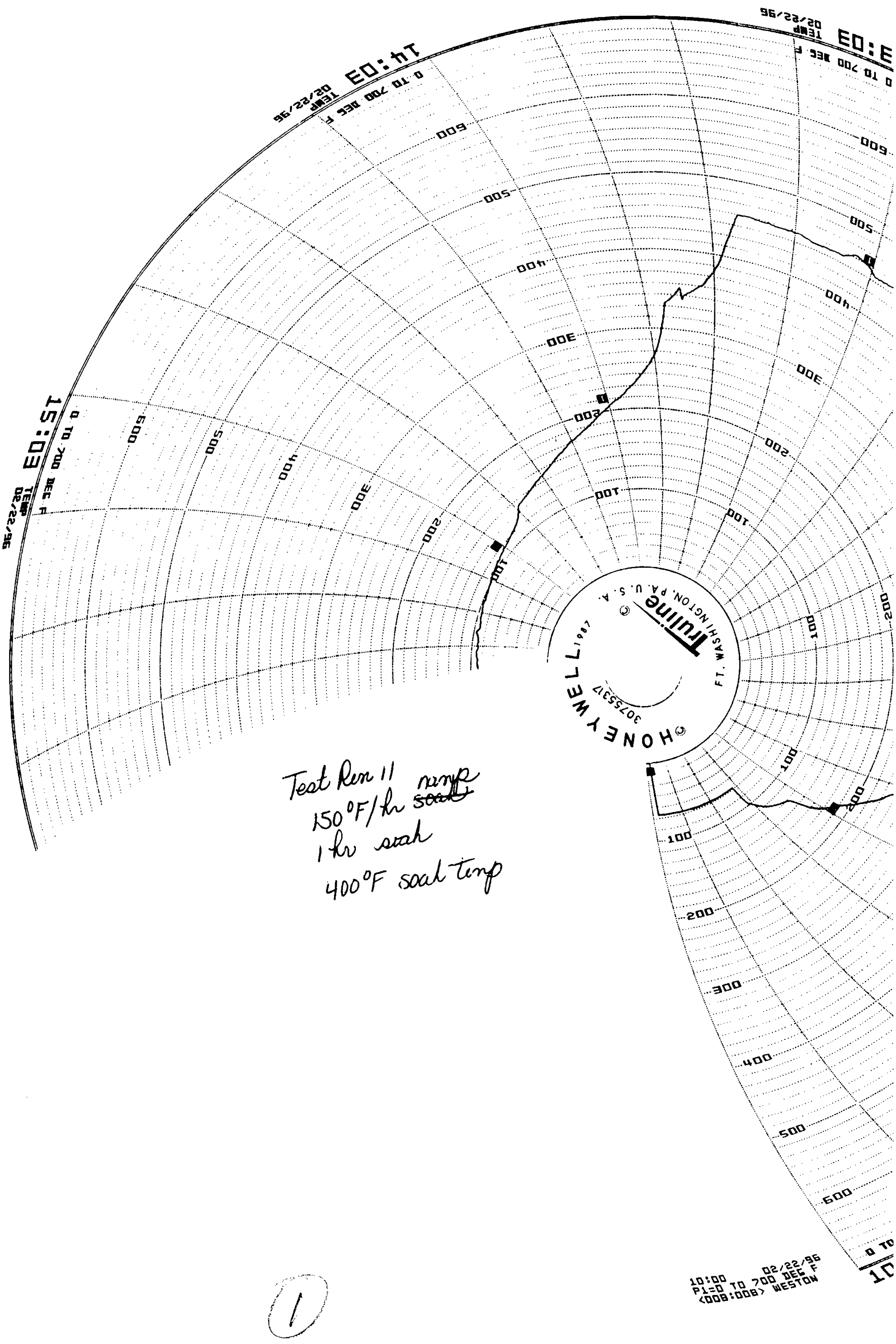
Test Number: ~~#~~ 11

Ramp-Up Rate: 150°F/hr

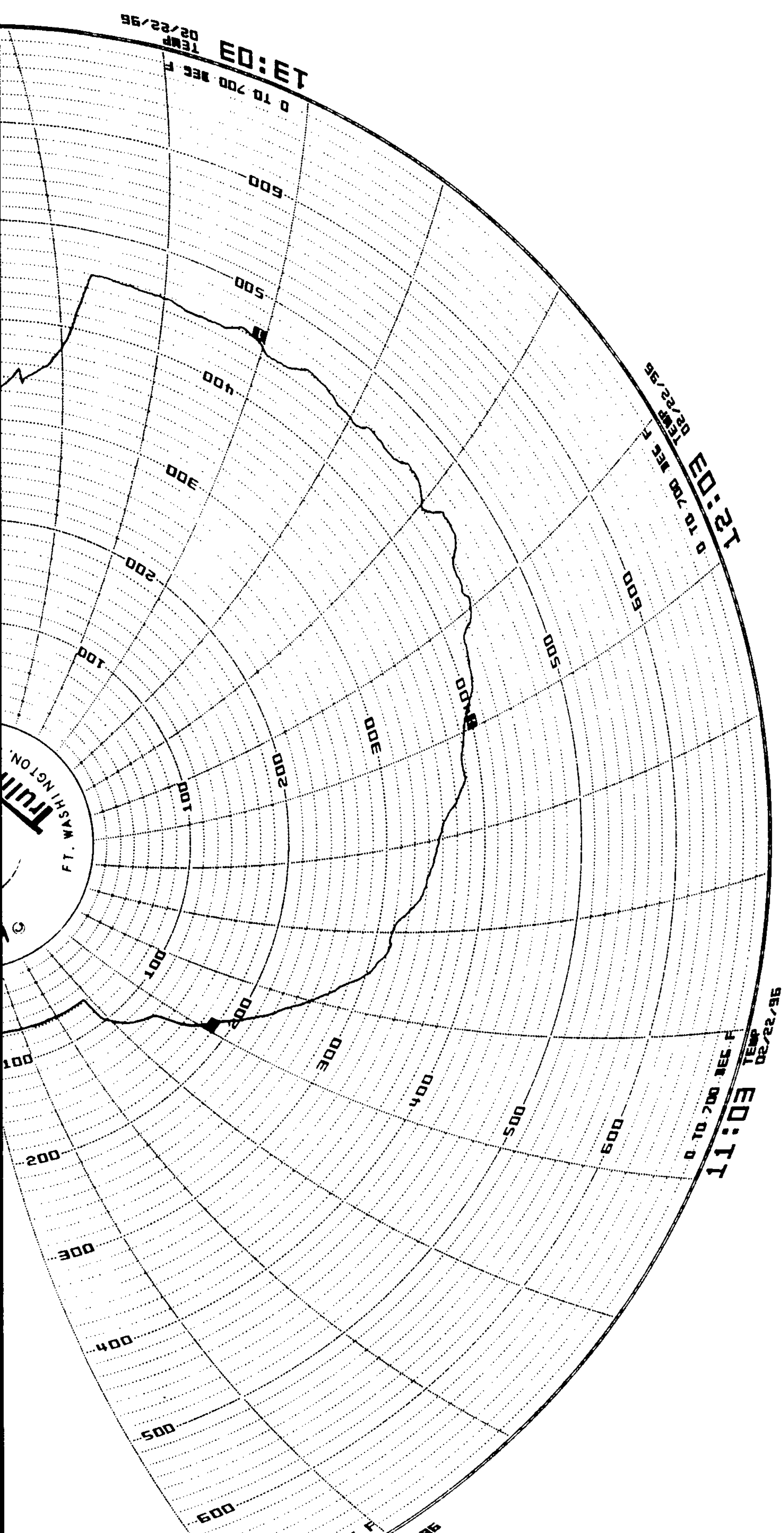
Soak Time: 1 hr

Soak Temp: 400°F

Tag	Description	Unit	1100	1200	1300	1400	1500
		Time:					
FURNACE							
PIT-232	Fuel Gas Pressure	In. WC	8.35	11.31	11.11	4.05	
FIT-231	Fuel Gas Flow	CFH	2	97	96	-1	
PIT-222	Combustion Air Pressure	In. WC	2240	23.03	22.91	21.15	
FIT-221	Combustion Air Flow	CFH	11400	10547	10569	12564	
PIT-158	Chamber Pressure	In. WC	-.30	-.24	-.44	-.25	
TIT-201	Recorder Temperature	Deg. F	132	383	458	209	
TIT-202	Furnace Exit Gas Temp (Control)	Deg. F	133	386	461	206	
TIT-203	Material Thermocouple #1	Deg. F	117	390	468	267	
TIT-204	Material Thermocouple #2	Deg. F	98	330	428	278	
TIT-205	Material Thermocouple #3	Deg. F	83	224	304	233	
TIT-206	Material Thermocouple #4	Deg. F	124	227	401	190	
TIT-207	Material Thermocouple #5	Deg. F	148	425	493	231	
		AVE	116	339	418	239	
AFTERBURNER							
TIT-131	Combustor Burner Temp. Control	Deg. F	1794	1808	1805	1803	
FIT-149	Fumes Flow	PPH ~~CFM~~	2314	2238	2141	2458	
PIT-151	Fumes Pressure (Furnace Draft)	In WC	.44	.36	.27	.60	
TIT-145	Combustor Temperature	Deg. F	1807	1820	1810	1812	
PIT-133	Fuel Pressure	PSIG	.67	.48	.40	.63	
TIT-121	Fuel Gas Flow	CFH ~~CFM~~	968	741	624	900	
CEM							
NOx-B	Interconnecting Duct NOx	ppm	-.3	.9	.9	-.6	
THC-B	Interconnecting Duct THC	ppm	100.0	89.5	97.6	2.3	
CO	Stack's CO	ppm	-.5	-.5	-.5	-.5	
THC	Stack's THC	ppm	-1.3	-1.3	-1.3	-1.5	
NOx	Stack's NOx	ppm	42.6	45.6	45.6	47.0	
SO2	Stack SO2	ppm	6.5	6.5	6.5	6.5	
[illegible]	Stack's O2	%	11.68	11.50	12.13	13.12	
CO2	Stack's CO2	%	5.90	6.04	5.68	5.0	
TIT-300	Ambient Temp	Deg. F	71.1	71.5	73.3		
Weather Service	Relative Humidity		67.4%	63.2%	63.1%		



Test Run 11 ramp ~~soak~~
150°F/hr
1 hr soak
400°F soak temp



10:00 02/22/96
P1=0 TO 700 DEG F
<008:008> WESTON

2

Pre - START-UP (1 of 3)	Test Number: #2
Date: 26 FEB 96	Ramp-Up Rate: 200°F hr
Time:	Soak Time: 1 hr.
	Soak Temp: 300°F

MECHANICAL

Initial each item.

[RJK] **Inspection doors/manways are SECURED**

[RJK] **Gas Valves OPEN**

[RJK] **View/Inspection Ports CLOSED**

[70%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

[RJK] **All Lockout/Tagouts (1-5) are ACCOUNTED.**

[RJK] **Furnace and Afterburner Control Breakers are ON.**

[RJK] **Verify Emergency Pushbuttons are NOT ENGAGED.**

[TJB] **BUMP Motors and switch to "AUTO"**

- ____ *Furnace Combustion Blower (M-220)*
- ____ *Afterburner Combustion Blower (M-130)*
- ____ *Afterburner I.D Fan (M-158)*
- ____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[GH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ *Interconnecting Duct - NOx*	75.1	76	Y
✓ *Interconnecting Duct - THC*	30.1	31	N
✓ *Stack NOx*	75.1	74	Y
✓ *Stack SO2*	126.4	126	Y
✓ *Stack THC*	30.1	31	N
✓ *Stack CO*	124	124.8	Y
✓ *Stack O2*	5.97	5.7	Y
✓ *Stack CO_2*	4.89	5.0	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[TJB] **Datalogger/Computer is ON**

- ✓ *Record Time (Computer Clock)*
- ✓ *Record Ambient Temperature (TIT-300)*
- ✓ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

[RJK] **Pre - Spike Activities**

- ✓ *Lock-out all Motors; Complete Exclusion Log*
- ✓ *Secure Equipment Pad and Access Road w/ Chains*
- ✓ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: 26 FEB 94

Time:

Test Number: #12

Ramp-Up Rate: 200°F hr.

Soak Time: 1 hr

Soak Temp: 300°F

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.

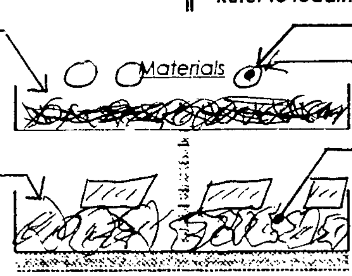
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LBS

BEFORE 1500 LBS

AFTER 1492 LBS

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEB 367 LBS	366 LBS
ROCK DEBRIS 367 LBS	360 LBS



Initial Wt.(lbs)	Final Wt.(lbs)
PIPE 69 LBS	69 LBS
CINDER BLOCK 97 LBS	97 LBS

**** Secure pipe to prevent pipes from rolling**

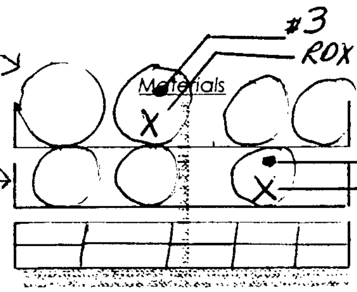
Take Pictures

#2 Rack B's Characteristics. 430 LBS

BEFORE 1500 LBS

AFTER 1500 LBS

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240 LBS	240 LBS
CLAY PIPE 204 LBS	204 LBS

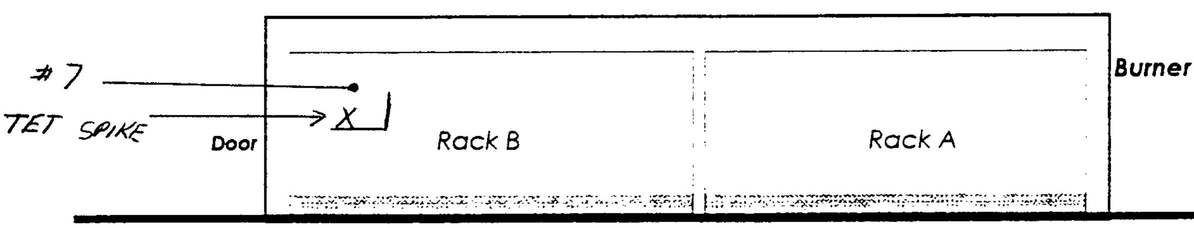


Initial Wt.(lbs)	Final Wt.(lbs)
CINDER BLOCKS 626 LBS	626 LBS

Take Pictures

**** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[signatures]

☐ **Complete Spike Sample Weigh Sheet**

**** *SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: 26 FEB 96

Time: ____________

Rmp-Up Time: ____________

Soak Time: ____________

Soak Temp: ____________

AFTERBURNER START-UP

Initial and record time for each item.

- [TLD] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [TLD] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [TLD] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [TLD] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [TLD] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ____________ :Time

@ 1200 F: ____________ :Time

@ 1800F: ____________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [TLD] **Set Bleed Air Damper to 75%**
- [TLD] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [TLD] **Set Controller to "MANUAL". Set controller output to 0.0**
- [TLD] **Turn Furnace Key to "BURNER" Position.**
- [TLD] **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [TLD] **Open Bleed Air Valve to 100%**
- [TLD] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
  Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [TLD] **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [ZLL] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ZLL] **STOP "OXIDIZER" and "AIR BLOWER"**
- ZL **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

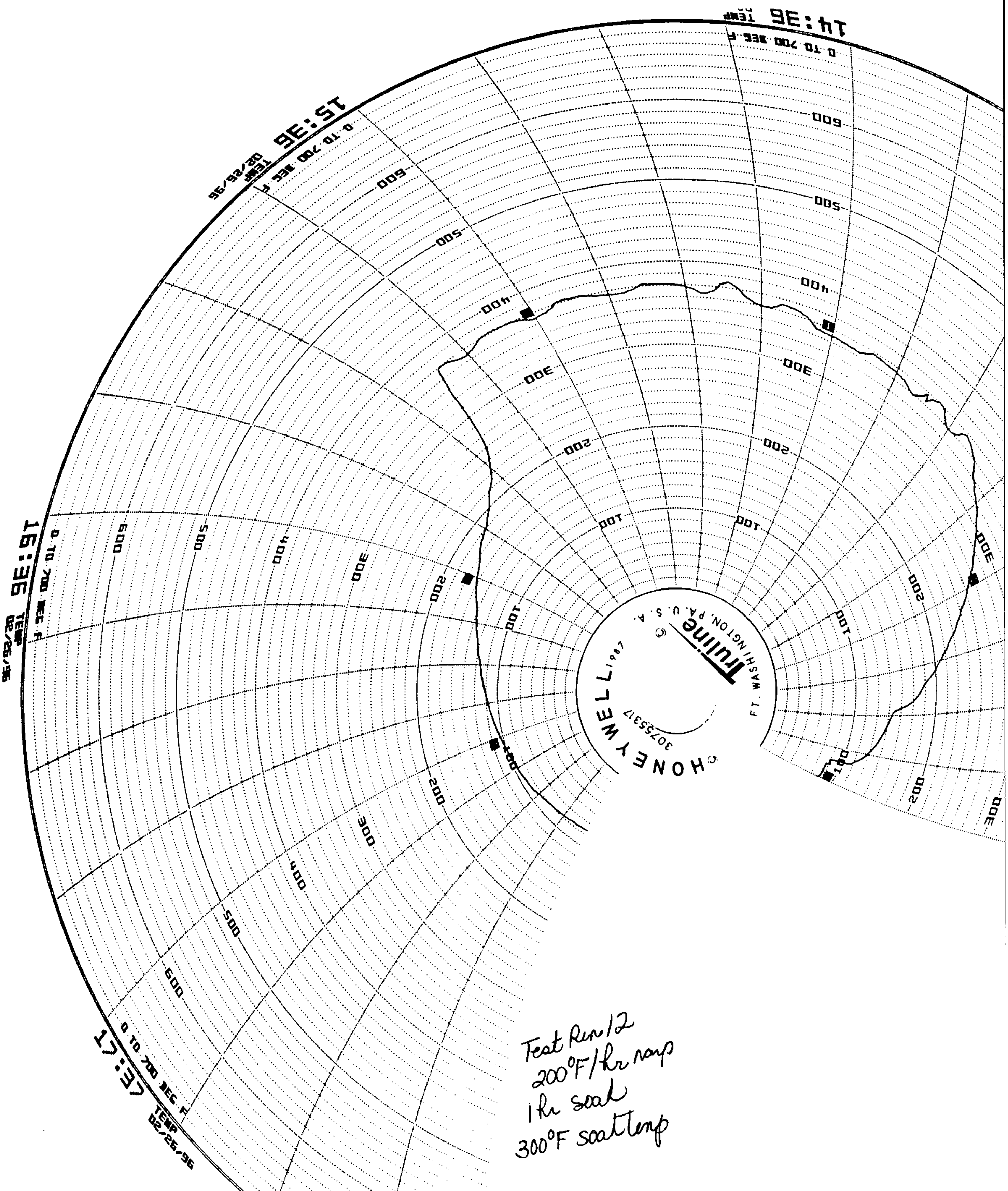
Test Number:	# 12
Ramp-Up Rate:	200° hr.
Soak Time:	1 hr.
Soak Temp:	300 °F

HOURLY DATALOG (___ of ___)

Date: 26 FEB 96

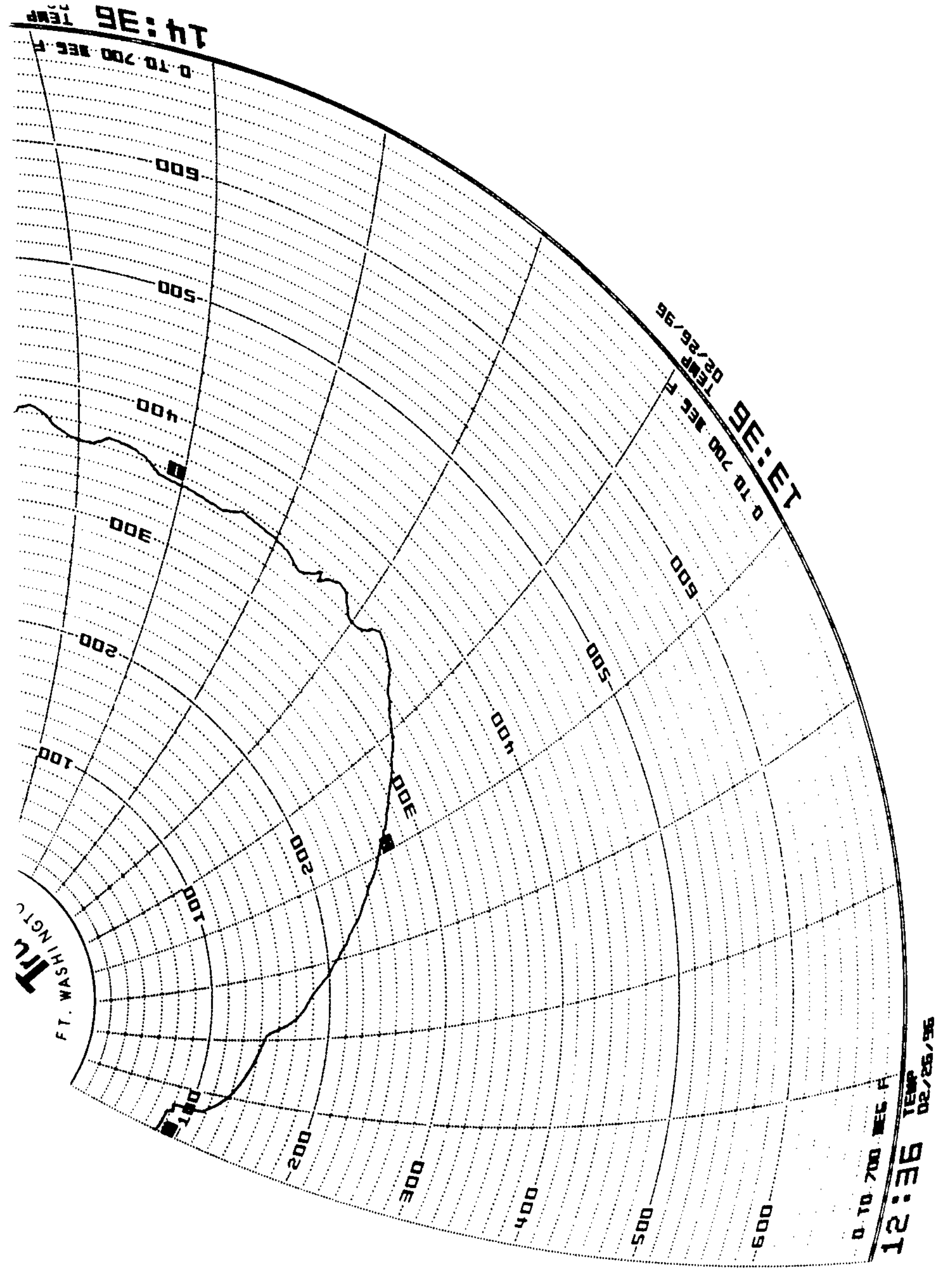
Time:

Tag	Description	Unit	1300	1400	1500	1600
		Time:				
FURNACE						
PIT-232	Fuel Gas Pressure	In.WC	7.43	10.69	10.71	4.16
FIT-231	Fuel Gas Flow	CFH	1	86	84	-2
PIT-222	Combustion Air Pressure	In.WC	21.68	23.3	22.42	21.07
FIT-221	Combustion Air Flow	CFH	11458	16459	10503	12483
PIT-158	Chamber Pressure	In.WC	-0.24	352	-0.21	-.21
TIT-201	Recorder Temperature	Deg.F	137	359	373	284
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	138	356	377	283
TIT-203	Material Thermocouple #1	Deg.F	127	345	370	355
TIT-204	Material Thermocouple #2	Deg.F	69	117	180	228
TIT-205	Material Thermocouple #3	Deg.F	98	220	287	319
TIT-206	Material Thermocouple #4	Deg.F	125	288	304	253
TIT-207	Material Thermocouple #5	Deg.F	140	350	376	305
	AVG. TEMP.		111	264	307	291
AFTERBURNER	TT-100 Exit Gas T.			320	344	262
TIT-131	Combustor Burner Temp. Control	Deg. F	1821	1823	1795	1777
FIT-149	Fumes Flow	CFM	2236	2299	2217	2393
PIT-151	Fumes Pressure (Furnace Draft)	InWC	.37	0.36	0.35	.53
TIT-145	Combustor Temperature	Deg. F	1836	1817	1820	1788
PIT-133	Fuel Pressure	PSIG	0.66	0.46	0.56	.53
TIT-121	Fuel Gas Flow	CFM	940	725	688	791
CEM						
NOx-B	Interconnecting Duct NOx	ppm	7.0	6.2	5.7	4.5
THC-B	Interconnecting Duct THC	ppm	100	69.3	72.4	13.5
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0
THC	Stack's THC	ppm	-2.1	-2.3	-2.1	-2.1
NOx	Stack's NOx	ppm	50.6	49.1	53.3	51.7
SO2	Stack SO2	ppm	1.0	1.0	1.0	1.0
	Stack's O2	%	10.60	10.82	9.97	11.98
CO2	Stack's CO2	%	4.30	4.22	4.36	3.70
TIT-300	Ambient Temp	Deg. F	78.3	80	80	76.6
Weather Service	Relative Humidity		57.4	52	54.[illegible]	55%



Test Run 12
200°F/hr ramp
1 hr soak
300°F soak temp

1



12:34 02/26/96
P1=0 TO 700 DEG F
<008:008> WESTON

2

Pre - START-UP (1 of 3)	**Test Number:** #13
Date: 26 FEB 96	**Ramp-Up Rate:** 200°F/hr
Time:	**Soak Time:** 1 hr
	Soak Temp: 500 °F

MECHANICAL

Initial each item.

- [KM] **Inspection doors/manways are SECURED**
- [KM] **Gas Valves OPEN**
- [KM] **View/Inspection Ports CLOSED**
- [70%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [TJB] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [TJB] **Furnace and Afterburner Control Breakers are ON.**
- [TJB] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [TJB] **BUMP Motors and switch to "AUTO"**
  - ✓ Furnace Combustion Blower (M-220)
  - ✓ Afterburner Combustion Blower (M-130)
  - ✓ Afterburner I.D Fan (M-158)
  - ✓ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [KM] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.1	74	N
✓ Interconnecting Duct - THC	30.1	32	N
✓ Stack NOx	75.6	78	N
✓ Stack SO2	124.4	124	N
✓ Stack THC	30.1	31	N
✓ Stack CO	124	122.6	Y
✓ Stack O2	5.97	5.6	Y
✓ Stack CO_2	4.84	4.9	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [TJB] **Datalogger/Computer is ON**
  - ✓ Record Time (Computer Clock)
  - ✓ Record Ambient Temperature (TT-300)
  - ✓ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

- [KZ] **Pre - Spike Activities**
  - ✓ Lock-out all Motors; Complete Exclusion Log
  - ✓ Secure Equipment Pad and Access Road w/ Chains
  - ✓ Spike Test Materials and Furnace Test Plates

LOADING/UNLOADING (2 of 3)	***Test Number***
Date:	***Ramp-Up Rate:***
Time:	***Soak Time:***
	Soak Temp:

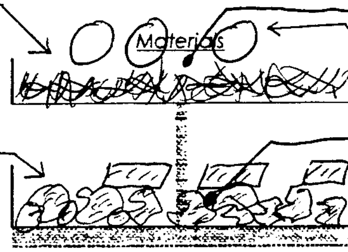
FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** *Refer to loading procedures for instructions.***

#1 Rack A's Characteristics.
600 LBS
BEFORE 1500 LBS
AFTER 1482

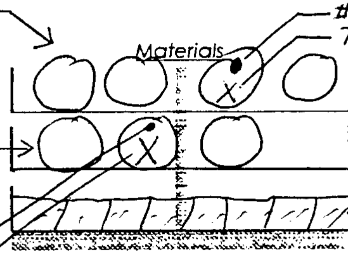


Initial Wt. (lbs)	*Final Wt. (lbs)*	*Initial Wt. (lbs)*	*Final Wt. (lbs)*
STEEL DEB 367 LBS	365 LBS	PIPE 42 LBS	42 LBS
ROCK DEB 367 LBS	351 LBS	CINDER BLOCK 124 LBS	122 LBS

**** *Secure pipe to prevent pipes from rolling***

Take Pictures

#2 Rack B's Characteristics.
430 LBS
BEFORE 1500 LBS
AFTER 1497



#6 TET
#3 ROX

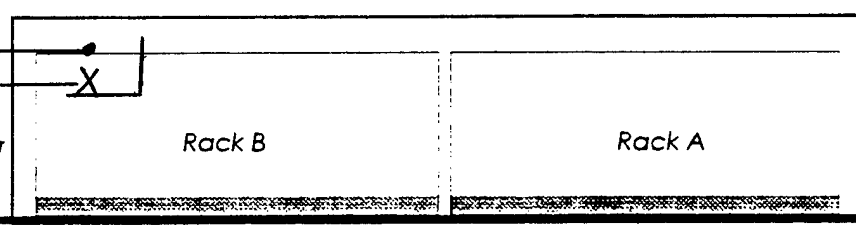
Initial Wt. (lbs)	*Final Wt. (lbs)*	*Initial Wt. (lbs)*	*Final Wt. (lbs)*
STEEL PIPE 240 LBS	240 LBS		
CLAY PIPE 204 LBS	204 LBS	CINDER BLOCK 626 LBS	623 LBS

Take Pictures

**** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**

#7
TNT



☐ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[signatures]

☐ **Complete Spike Sample Weigh Sheet**

**** *SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: ______________________ Rmp-Up Time: ______________________

Time: ______________________ Soak Time: ______________________

Soak Temp: ______________________

AFTERBURNER START-UP

Initial and record time for each item.

- [ ] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [ ] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [ ] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [ ] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [ ] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ____________ :Time

@ 1200 F: ____________ :Time

@ 1800F: ____________ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature
1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- [ ] **Set Bleed Air Damper to 75%**
- [ ] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [ ] **Set Controller to "MANUAL". Set controller output to 0.0**
- [ ] **Turn Furnace Key to "BURNER" Position.**
- [ ] **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [ ] **Open Bleed Air Valve to 100%**
- [ ] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
  Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust
ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- [ ] **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [ ] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ ] **STOP "OXIDIZER" and "AIR BLOWER"**
- [ ] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

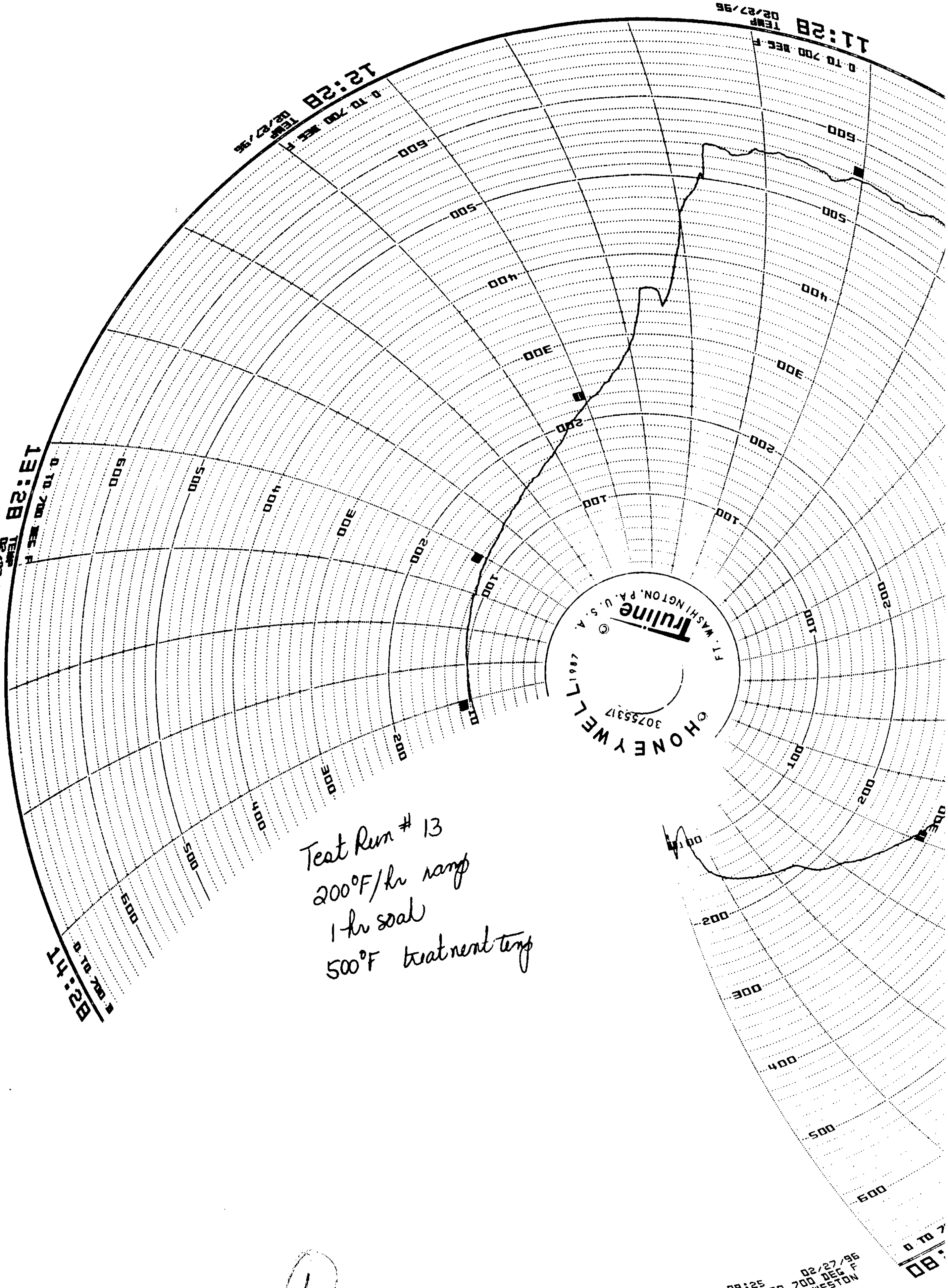
***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

Test Number: #13
Ramp-Up Rate: 200°F/hr
Soak Time: 1 hr
Soak Temp: 500°F

HOURLY DATALOG (of)

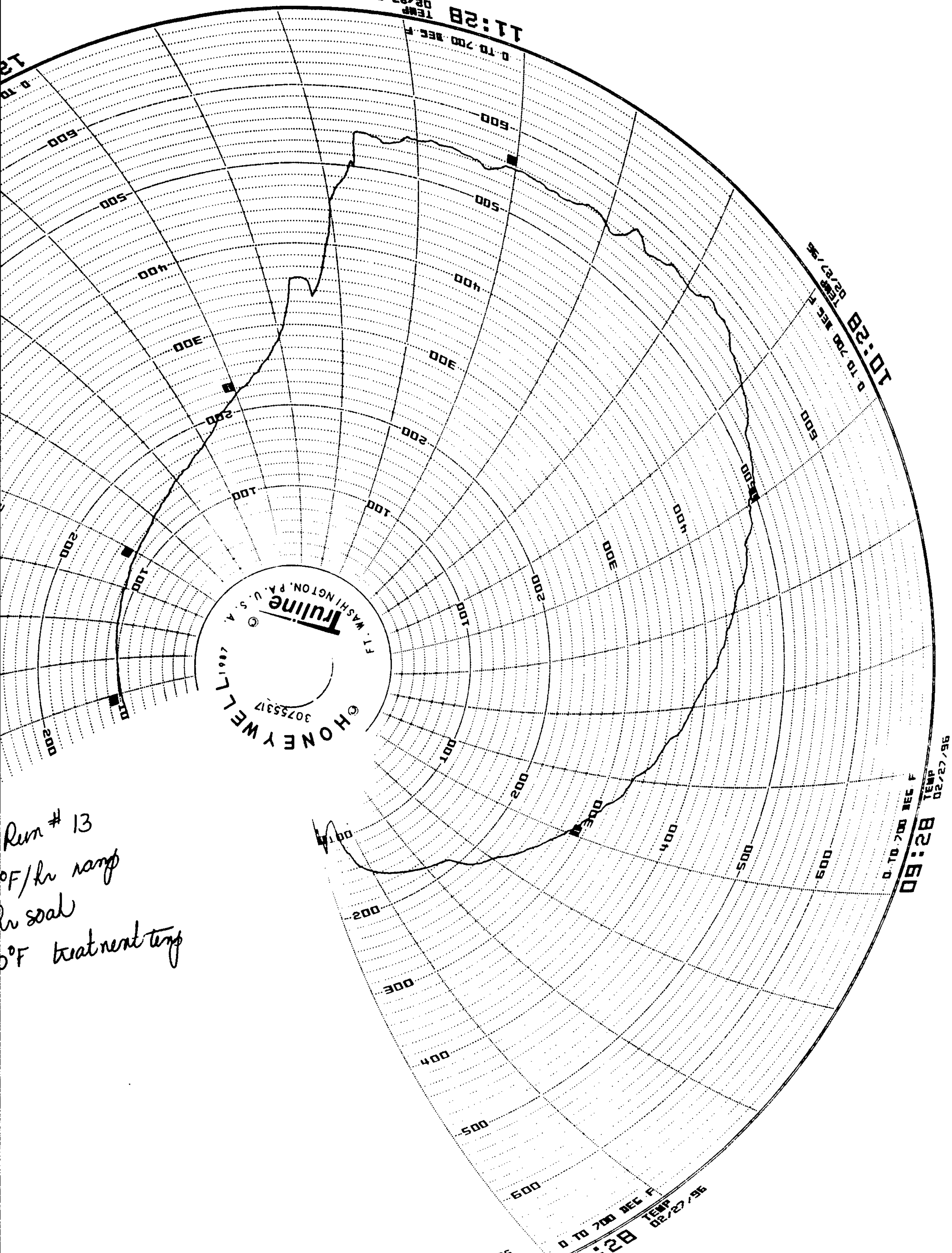
Date: 26 FEB 96
Time:

Tag	Description	Unit	0900	1000	1100	1215
		Time:				
FURNACE						
PIT-232	Fuel Gas Pressure	in.WC	8.67	10.39	11.14	3.41
FIT-231	Fuel Gas Flow	CFH	42	101	130	-.2
PIT-222	Combustion Air Pressure	in.WC	23.12	23.37	23.39	21.89
FIT-221	Combustion Air Flow	CFH	10731	10113	9959	11984
PIT-158	Chamber Pressure	in.WC	-0.28	-.24	-.21	0.42
TIT-201	Recorder Temperature	Deg.F	173	379	565	268
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	175	382	569	263
TIT-203	Material Thermocouple #1	Deg.F	170	392	577	252
TIT-204	Material Thermocouple #2	Deg.F	129	267	403	268
TIT-205	Material Thermocouple #3	Deg.F	117	270	463	385
TIT-206	Material Thermocouple #4	Deg.F	145	313	487	267
TIT-207	Material Thermocouple #5	Deg.F	194	426	621	296
	AVG. TEMP.		151°	333	509	292
	TIT 100, EXIT GAS TEMP.		158°	330	493	255
AFTERBURNER						
TIT-131	Combustor Burner Temp. Control	Deg. F	1820	1798	1850	
FIT-148	Fumes Flow	CFM	2233	2156	2193	3110
PIT-151	Fumes Pressure (Furnace Draft)	inWC	0.41	0.34	0.37	1.19
TIT-145	Combustor Temperature	Deg. F	1832	1790	1803	1823
PIT-133	Fuel Pressure	PSIG	0.64	0.31	0.39	0.80
TIT-121	Fuel Gas Flow	CFM	920	782	617	1095
CEM						
NOx-B	Interconnecting Duct NOx	ppm	0.0	0.9	3.6	2.9
THC-B	Interconnecting Duct THC	ppm	73.8	43.9	32.0	0.4
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0
THC	Stack's THC	ppm	2.1	1.7	1.7	1.8
NOx	Stack's NOx	ppm	46.9	56.9	54.8	51.6
SO2	Stack SO2	ppm	1.0	1.0	1.5	2.5
	Stack's O2	%	10.30	9.48	9.82	11.47
CO2	Stack's CO2	%	5.88	6.40	6.00	4.08
TIT-300	Ambient Temp	Deg. F	67	73°		77
Weather Service	Relative Humidity		89	75%		60



Test Run # 13
200°F/hr ramp
1 hr soak
500°F treatment temp

1



Run # 13
°F/hr ramp
hr soak
°F treatment temp

08:25 02/27/96
P1=0 TO 700 DEG F
<008:008> WESTON

(2)

Test Number: #14
Ramp-Up Rate: 300°F/hr
Soak Time: 1 hr
Soak Temp: 600°F

Pre - START-UP (1 of 3)

Date: 27 FEB 96
Time:

MECHANICAL

Initial each item.

[RR] **Inspection doors/manways are SECURED**
[RR] **Gas Valves OPEN**
[RR] **View/Inspection Ports CLOSED**
[70%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

[TB] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
[TB] **Furnace and Afterburner Control Breakers are ON.**
[TB] **Verify Emergency Pushbuttons are NOT ENGAGED.**
[TB] **BUMP Motors and switch to "AUTO"**

- ____ *Furnace Combustion Blower (M-220)*
- ____ *Afterburner Combustion Blower (M-130)*
- ____ *Afterburner I.D Fan (M-158)*
- ____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[JH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	74	
✓ Interconnecting Duct - THC	31.1	31	
✓ Stack NOx	75.6	75	
✓ Stack SO2	126.4	123	Y
✓ Stack THC	31.1	31	
✓ Stack CO	124	123.8	Y
✓ Stack O2	5.97	5.7	
✓ Stack CO_2	4.89	4.7	

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[ ] **Datalogger/Computer is ON**

- ____ *Record Time (Computer Clock)*
- ____ *Record Ambient Temperature (TIT-300)*
- ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

[RR] **Pre - Spike Activities**

- ✓ *Lock-out all Motors: Complete Exclusion Log*
- ✓ *Secure Equipment Pad and Access Road w/ Chains*
- ✓ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)	**Test Number**
Date:	**Ramp-Up Rate:**
Time:	**Soak Time:**
	Soak Temp:

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

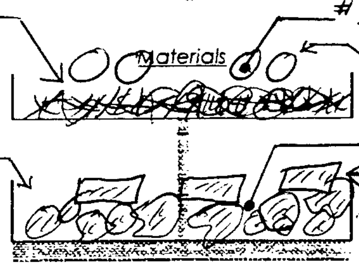
For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LB

BEFORE 1500 LB
AFTER 1475

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEB 367 LBS	359 LBS
ROCK DEB 367 LBS	350 LBS

**** Secure pipe to prevent pipes from rolling**



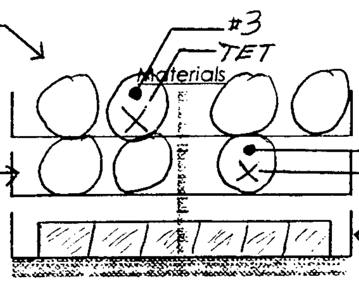
Take Pictures

Initial Wt.(lbs)	Final Wt.(lbs)
PIPE 27 LBS	27 LBS
CINDER BLOCK 139 LBS	139 LBS

#2 Rack B's Characteristics. 430 LBS

BEFORE 1500 LBS
AFTER 1498

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240 LBS	240 LBS
CLAY PIPE 204 LBS	204 LBS

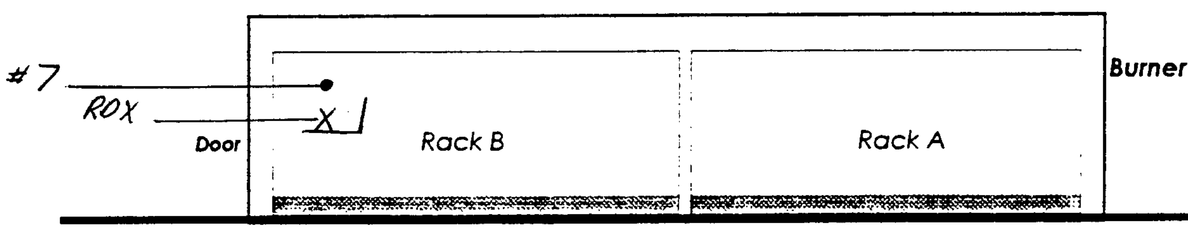


Take Pictures

Initial Wt.(lbs)	Final Wt.(lbs)
CINDER BLOCK 626 LBS	624 LBS

***** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

[signature] Kevin D. Hendon[?]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

Date: ______________________

Time: ______________________

Rmp-Up Time: ______________________

Soak Time: ______________________

Soak Temp: ______________________

AFTERBURNER START-UP

Initial and record time for each item.

- [ ] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [ ] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [ ] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [ ] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [ ] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: __________ :Time

@ 1200 F: __________ :Time

@ 1800F: __________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- [ ] **Set Bleed Air Damper to 75%**
- [ ] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [ ] **Set Controller to "MANUAL". Set controller output to 0.0**
- [ ] **Turn Furnace Key to "BURNER" Position.**
- [ ] **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- [ ] **Open Bleed Air Valve to 100%**
- [ ] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.*

- [ ] **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [x] KJ **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [x] KJ **STOP "OXIDIZER" and "AIR BLOWER"**
- [x] KJ **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

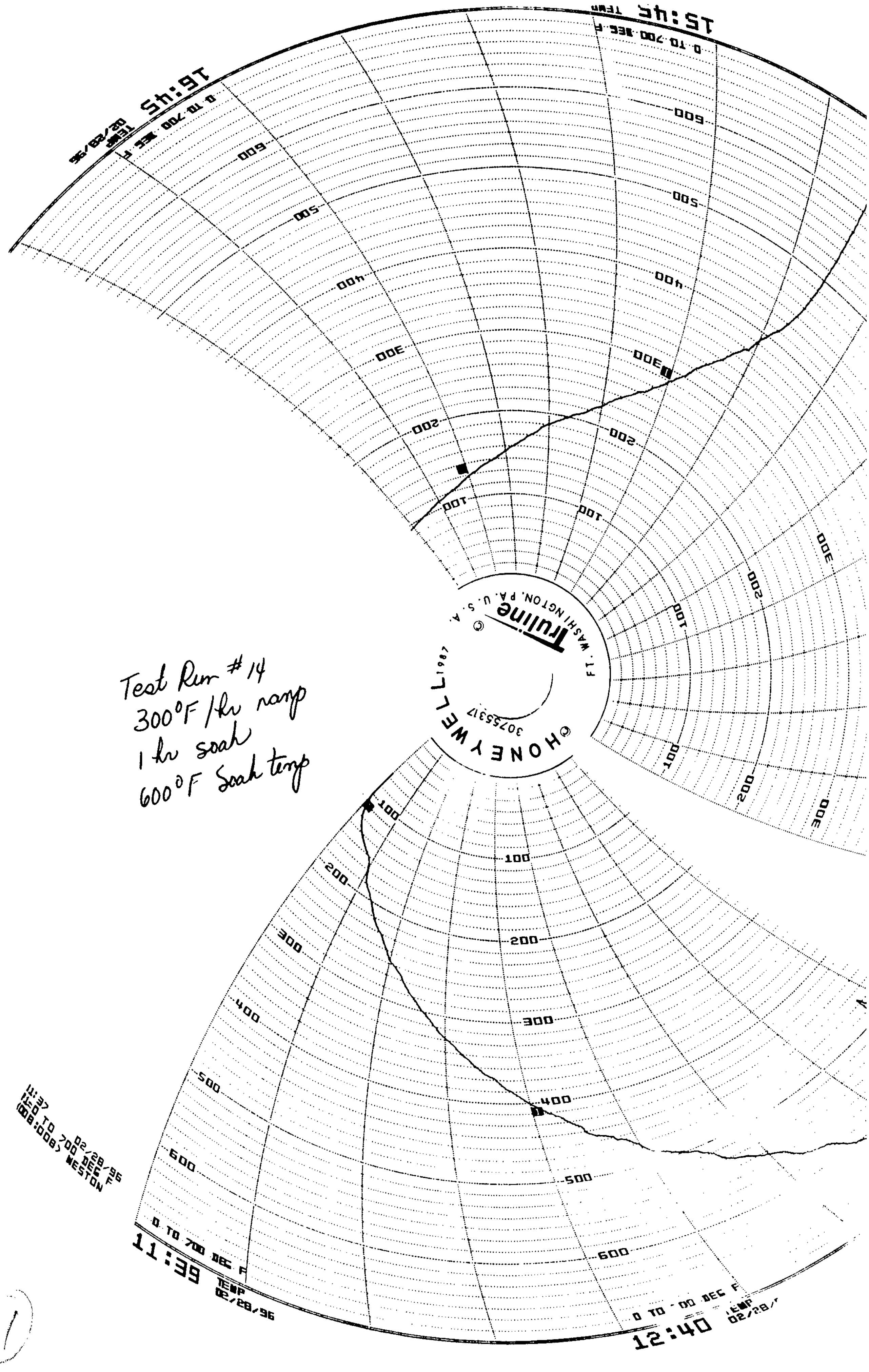
***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (__ of __)

Date: 28 FEB 96
Time:

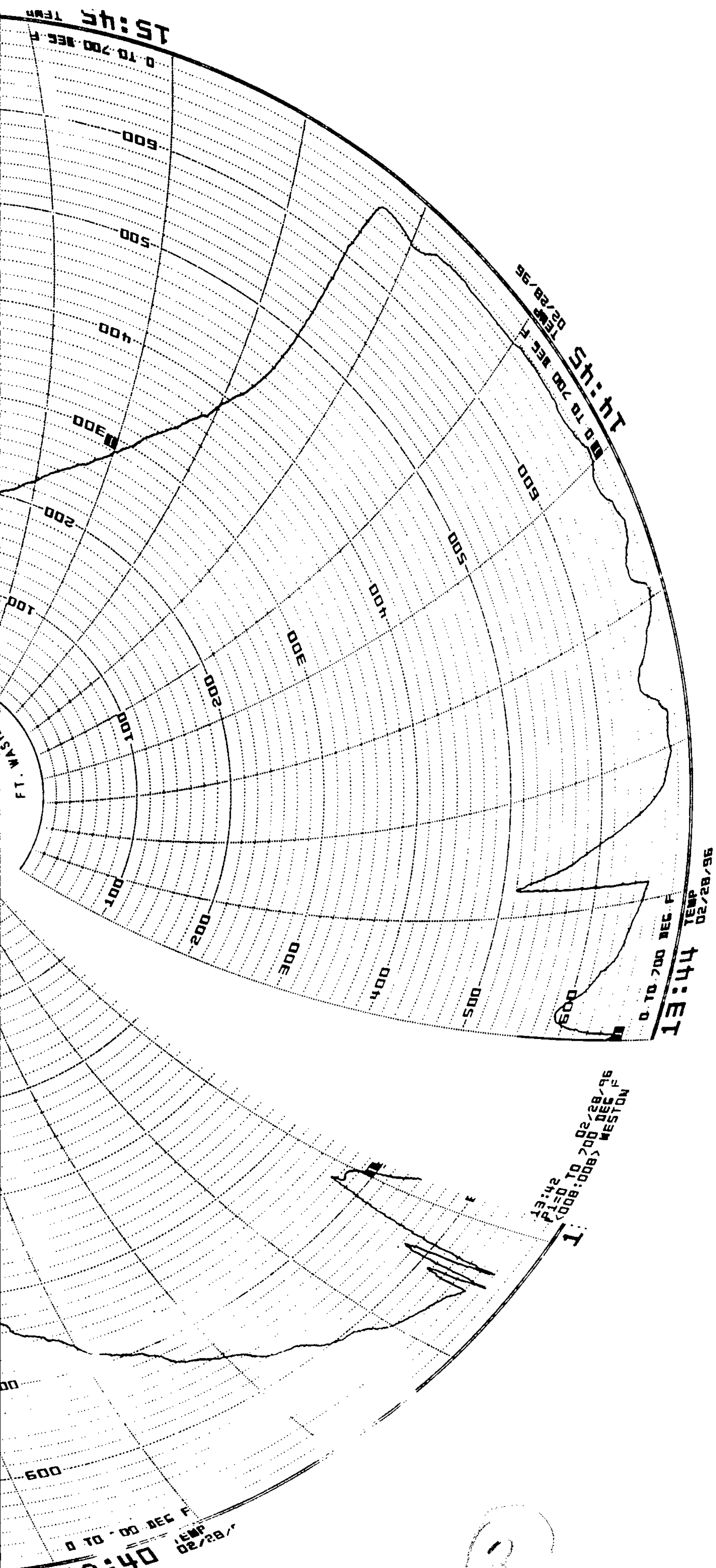
Test Number: # 14
Ramp-Up Rate: 300°F hr.
Soak Time: 1 hr
Soak Temp: 600°F

Tag	Description	Unit	1200	1300	1400	1500
FURNACE						
PIT-232	Fuel Gas Pressure	In.WC	9.40	11.12	11.72	11.42
FIT-231	Fuel Gas Flow	CFH	54	123	160	128
PIT-222	Combustion Air Pressure	In.WC	23.35	23.59	23.87	23.99
FIT-221	Combustion Air Flow	CFH	10563	10053	10011	10136
PIT-158	Chamber Pressure	In.WC	-0.40	-0.20	-0.29	-0.42
TIT-201	Recorder Temperature	Deg.F	180	462	645	665
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	182	467	650	669
TIT-203	Material Thermocouple #1	Deg.F	161	422	607	649
TIT-204	Material Thermocouple #2	Deg.F	124	284	428	498
TIT-205	Material Thermocouple #3	Deg.F	106	333	557	629
TIT-206	Material Thermocouple #4	Deg.F	151	383	539	579
TIT-207	Material Thermocouple #5	Deg.F	200	512	702	706
	AVG. TEMP.		151	389	567	610
	TIT 100 EXIT GAS		160	383	551	592
AFTERBURNER						
TIT-131	Combustor Burner Temp. Control	Deg. F	462	463	462	462
FIT-149	Fumes Flow	CFM	2276	2146	2263	2103
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.44	0.30	0.37	0.29
TIT-145	Combustor Temperature	Deg. F	1866	1795	1826	1836
PIT-133	Fuel Pressure	PSIG	0.68	0.44	0.43	0.33
TIT-121	Fuel Gas Flow	CFM	971	673	631	557
CEM						
NOx-B	Interconnecting Duct NOx	ppm	-5.4	-3.5	-3.4	-3.7
THC-B	Interconnecting Duct THC	ppm	39.9	18.9	16.7	17.4
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0
THC	Stack's THC	ppm	-0.7	-0.7	-0.7	-0.7
NOx	Stack's NOx	ppm	40.4	78.3	41.0	45.1
SO2	Stack SO2	ppm	2.0	2.0	2.0	2.0
	Stack's O2	%	11.39	10.85	10.48	11.03
CO2	Stack's CO2	%	5.9	6.2	6.42	6.16
TIT-300	Ambient Temp	Deg. F	60°	52		57
Weather Service	Relative Humidity		63%	54		53



Test Run #14
300°F/hr ramp
1 hr soak
600°F Soak temp

1



13:44
0 TO 700 DEG F
TEMP
02/28/96
13:42
P1=0 TO 700 DEG F
02/28/96
<008:008> WESTON
12:40
TEMP
02/28/

Pre - START-UP (1 of 3)

Date: MARCH 1 96
Time:

Test Number: #15
Ramp-Up Rate: 300°F/hr
Soak Time: 1hr
Soak Temp: 600°F

MECHANICAL

Initial each item.

- [KA] **Inspection doors/manways are SECURED**
- [KA] **Gas Valves OPEN**
- [KA] **View/Inspection Ports CLOSED**
- [70%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

70%

ELECTRICAL

Initial each item.

- [TJB] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [TJB] **Furnace and Afterburner Control Breakers are ON.**
- [TJB] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [TJB] **BUMP Motors and switch to "AUTO"**
  - ______ Furnace Combustion Blower (M-220)
  - ______ Afterburner Combustion Blower (M-130)
  - ______ Afterburner I.D Fan (M-158)
  - ______ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [JH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	77	
✓ Interconnecting Duct - THC	31.1	31	Y
✓ Stack NOx	75.6	75	
✓ Stack SO2	126.4	126	
✓ Stack THC	31.1	31	
✓ Stack CO	124	123.6	
✓ Stack O2	5.97	5.9	Y
✓ Stack CO_2	4.89	4.9	

*** Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [TJB] **Datalogger/Computer is ON**
  - ______ Record Time (Computer Clock)
  - ______ Record Ambient Temperature (TT-300)
  - ______ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

- [KA] **Pre - Spike Activities**
  - ✓ Lock-out all Motors: Complete Exclusion Log
  - ✓ Secure Equipment Pad and Access Road w/ Chains
  - ✓ Spike Test Materials and Furnace Test Plates

Test Number	
Ramp-Up Rate:	
Soak Time:	
Soak Temp:	

›ADING/UNLOADING (2 of 3)

Date:

Time:

≡LD ACTIVITIES

Initial each item.

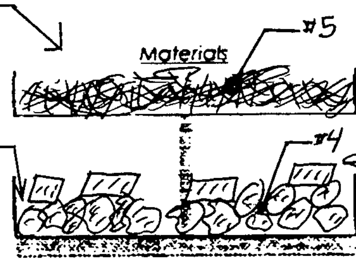
] **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc
** **Refer to loading procedures for instructions.**

#1 Rack A's Characteristics 600 LBS

START 1500
END 1476 LBS

Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEB 363 LBS	STEEL DEB 360 LBS		
ROCK DEB 367 LBS	ROCK DEB 354 LBS	CINDER BLOCK 170 LBS	CINDER BLOCK 164 LBS



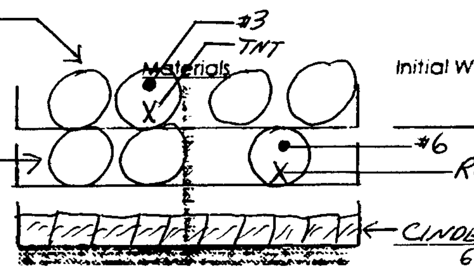
Take Pictures

** **Secure pipe to prevent pipes from rolling**

#2 Rack B's Characteristics 430 LBS

START 1500 LBS
END 1495 LBS

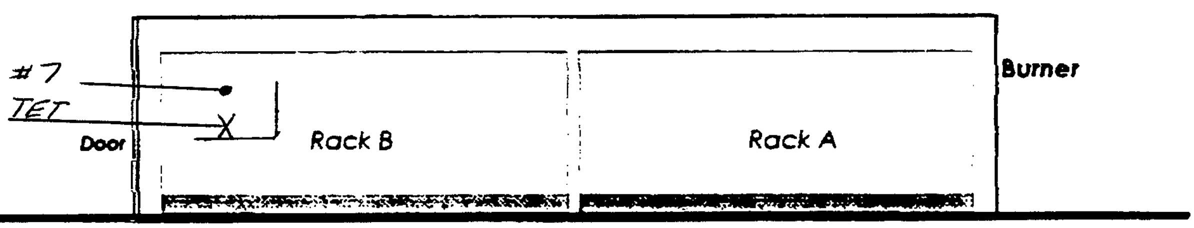
Initial Wt.(lbs)	Final Wt.(lbs)	Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240 LBS	STEEL PIPE 240 LBS		
CLAY PIPE 204 LBS	CLAY PIPE 204 LBS	CINDER BLOCK 626 LBS	CINDERBLOCK 621 LBS



Take Pictures

** **SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

] **Mark Locations of Thermocouples**



] **Roll Calls and Close Furnace Door**

[illegible]

[illegible]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

] **Complete Spike Sample Weigh Sheet**

** **SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

Date: ___________ Rmp-Up Time: ___________
Time: ___________ Soak Time: ___________
Soak Temp: ___________

..ERBURNER START-UP

Initial and record time for each item.

- TJB Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC
- TJB Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC
- TJB Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- TJB Start "DATALOGGER" Pushbuttons on the Computer.
- TJB Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC

@ 600 F: ________ :Time
@ 1200 F: ________ :Time
@ 1800F: ________ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- TJB Set Bleed Air Damper to 75%
- TJB Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC
- TJB Set Controller to "MANUAL". Set controller output to 0.0
- TJB Turn Furnace Key to "BURNER" Position.
- TJB Verify "INTERLOCK OK" Light is energized.

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- TJB Open Bleed Air Valve to 100%
- TJB Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- TJB Manually Log Operating Parameters.

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS**

COOL-DOWN

Initial and record time for each item.

- TJB Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.
- TJB STOP "OXIDIZER" and "AIR BLOWER"
- TJB STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.

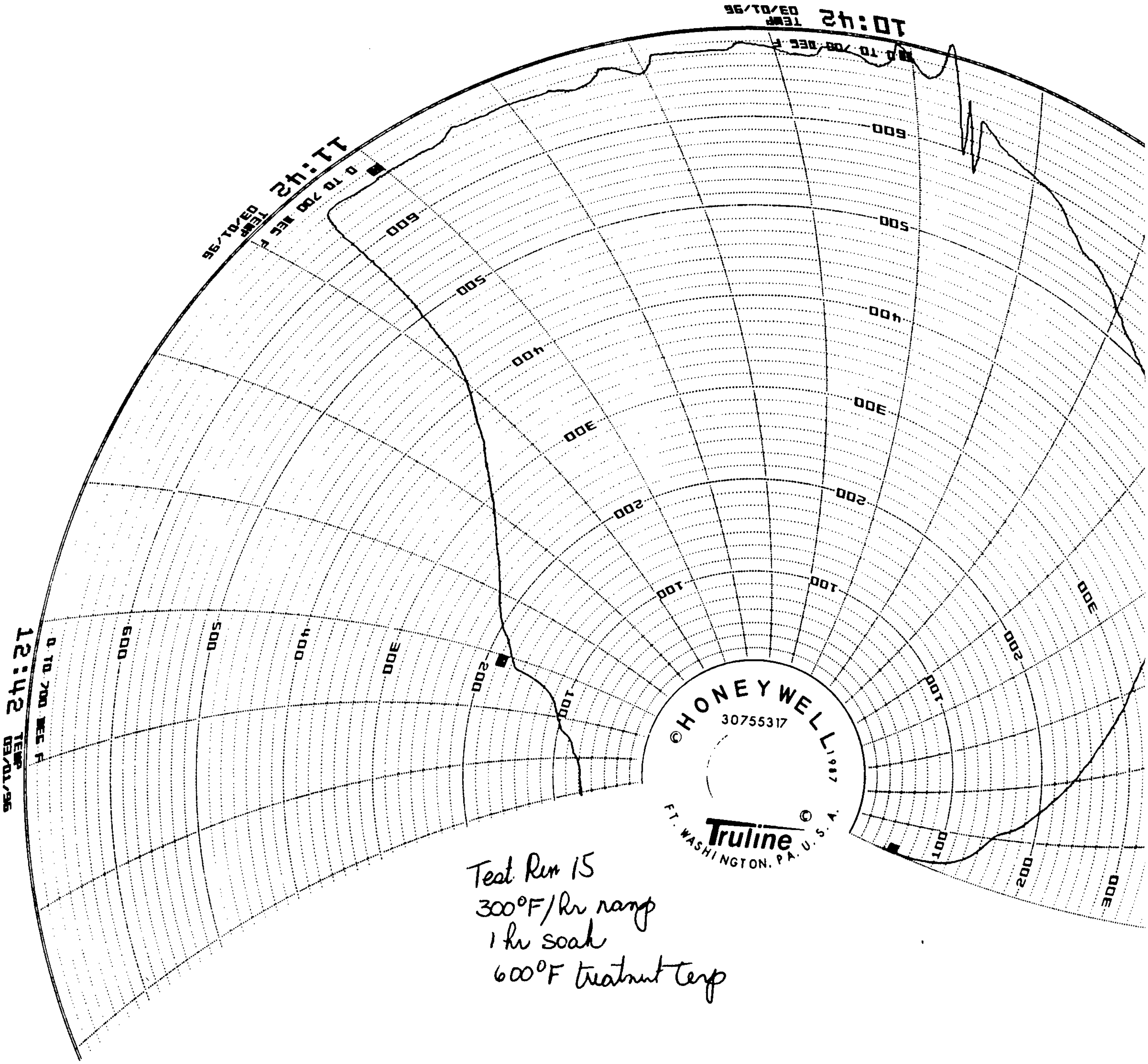
** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.**

HOURLY DATALOG (__ of __)

Date: MARCH 1 96
Time:

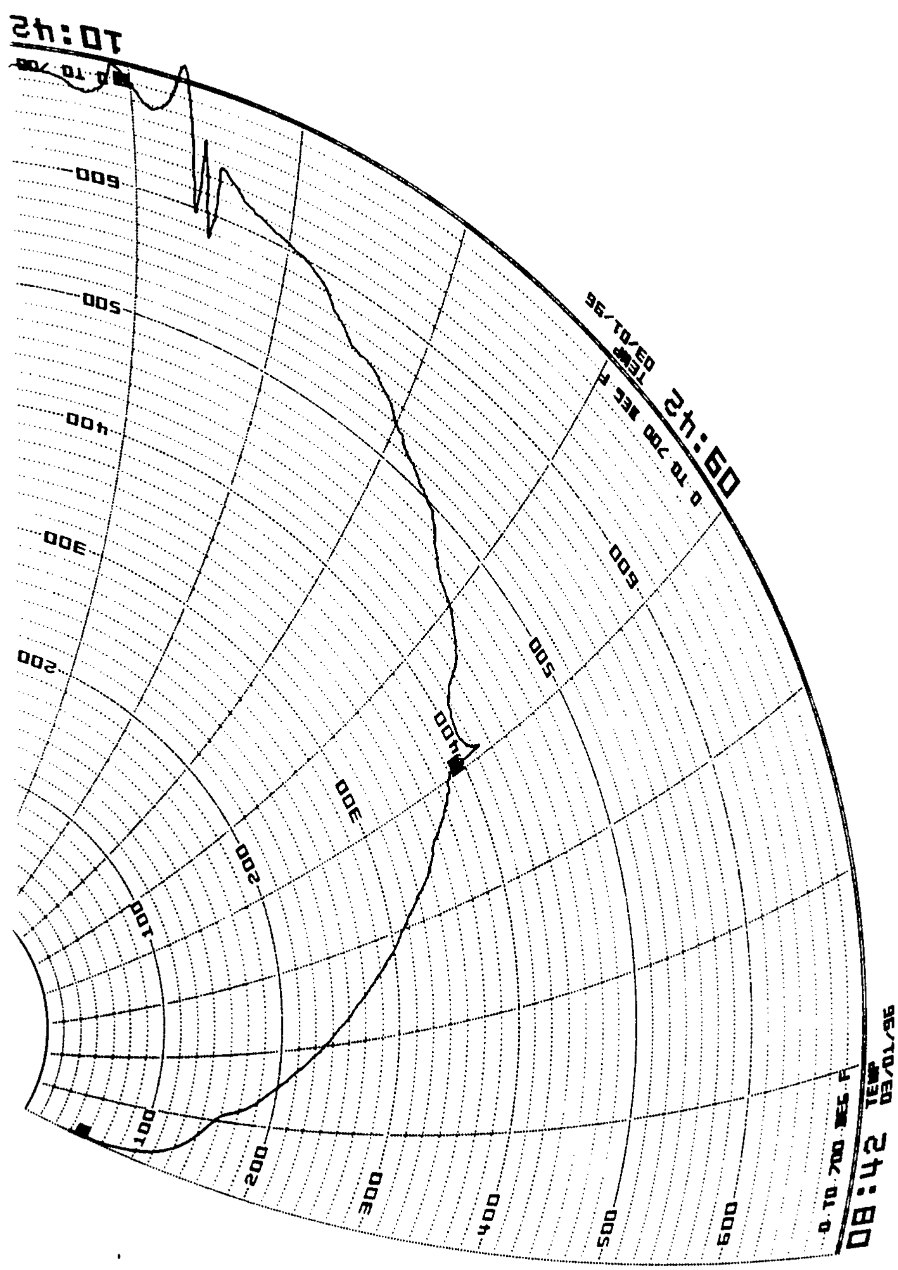
Test Number: #15
Ramp-Up Rate: 300°F/hr.
Soak Time: 1hr.
Soak Temp: 600°F

Tag	Description	Unit	0900	1000	11:00	1200
		Time:				
FURNACE						
PIT-232	Fuel Gas Pressure	In.WC	9.44	12.05	12.40	8.31
FIT-231	Fuel Gas Flow	CFH	46	132	168	-1
PIT-222	Combustion Air Pressure	In.WC	24.58	24.91	24.90	18.40
FIT-221	Combustion Air Flow	CFH	10988	10239	10154	16564
PIT-150	Chamber Pressure	In.WC	-0.29	-0.23	-0.24	-0.43
TIT-201	Recorder Temperature	Deg.F	150	438	679	337
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	150	445	686	333
TIT-203	Material Thermocouple #1	Deg.F	149	395	644	411
TIT-204	Material Thermocouple #2	Deg.F	121	304	539	373
TIT-205	Material Thermocouple #3	Deg.F	100	273	529	474
TIT-206	Material Thermocouple #4	Deg.F	132	361	581	333
TIT-207	Material Thermocouple #5	Deg.F	183	482	719	292
	AVG. TEMP-		154	363	601	373
	TIT 100 EXIT GAS TEMP.		157	359	573	303
AFTERBURNER						
TIT-131	Combustor Burner Temp. Control	Deg. F	1839	1823	1839	1803
FIT-140	Fumes Flow	CFM	2058	2109	2194	3560
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.33	0.32	0.34	1.21
TIT-145	Combustor Temperature	Deg. F	1837	1852	1838	1790
PIT-133	Fuel Pressure	PSIG	0.62	0.50	035	.85
TIT-121	Fuel Gas Flow	CFM	859	744	580	1094
CEM						
NOx-B	Interconnecting Duct NOx	ppm	1.4	2.3	3.4	1.1
THC-B	Interconnecting Duct THC	ppm	68.4	39.1	28.2	4.0
CO	Stack's CO	ppm	0.0	0.0	0.0	0.0
THC	Stack's THC	ppm	-0.1	-0.2	-0.2	-0.2
NOx	Stack's NOx	ppm	48.8	55.1	47.3	44.6
SO2	Stack SO2	ppm	1.5	2.0	2.0	2.0
	Stack's O2	%	10.07	9.27	9.63	12.20
CO2	Stack's CO2	%	6.34	6.30	632	4.42
TIT-300	Ambient Temp	Deg. F	42	44	45	46.6
Weather Service	Relative Humidity		53	54	48	42.2



Test Run 15
300°F/hr ramp
1 hr soak
600°F treatment temp

1



08:40 03/01/96
P1=0 TO 700 DEG F
<008:008> WESTON

2

Pre - START-UP (1 of 3)

Date: 6 March 96

Time: ______

Test Number: 16A
Ramp-Up Rate: 300°/HR
Soak Time: None
Soak Temp: 600°

MECHANICAL

Initial each item.

[AH] **Inspection doors/manways are SECURED**
[AH] **Gas Valves OPEN**
[AH] **View/Inspection Ports CLOSED**
[AH] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

68.5% (12,330 gal)

ELECTRICAL

Initial each item.

[AH] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
[AH] **Furnace and Afterburner Control Breakers are ON.**
[AH] **Verify Emergency Pushbuttons are NOT ENGAGED.**
[AH] **BUMP Motors and switch to "AUTO"**

- ✓ *Furnace Combustion Blower (M-220)*
- ✓ *Afterburner Combustion Blower (M-130)*
- ✓ *Afterburner I.D Fan (M-158)*
- ✓ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[AH] **Calibrate CEM**

		Tank Values	Recorded Values	Adjustment (Y/N)
✓	Interconnecting Duct - NOx	75.6	75	Y
✓	Interconnecting Duct - THC	31.1	31	Y
✓	~~Stack NOx~~ Duct NO	75.6	75	Y
✓	Stack SO2	126.4	126	N
✓	Stack THC	31.1	31	Y
✓	Stack CO	124.0	124.0	Y
✓	Stack O2	5.97	6.0	Y
✓	Stack CO2	4.89	4.9	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[AH] **Datalogger/Computer is ON**

- ____ *Record Time (Computer Clock)*
- ____ *Record Ambient Temperature (TIT-300)*
- ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

[RGK] **Pre - Spike Activities**

- ✓ *Lock-out all Motors: Complete Exclusion Log*
- ✓ *Secure Equipment Pad and Access Road w/ Chains*
- ✓ *Spike Test Materials and Furnace Test Plates*

Test Number 16A

ADING/UNLOADING (2 of 3)

Date: 6 March 96
Time:

Ramp-Up Rate: 300°/HR
Soak Time: None
Soak Temp: 600°

:LD ACTIVITIES ALL SPIKES TNT

Initial each item.

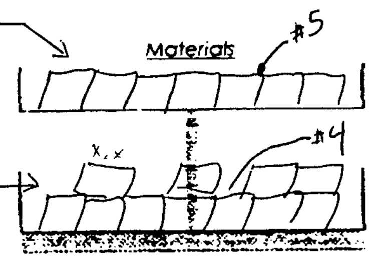
] **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics. 600 LBS

1500 BEFORE
AFTER 1417

Initial Wt. (lbs)	Final Wt. (lbs)
1460 LBS CINDER BLOCKS	1317 LBS



Take Pictures

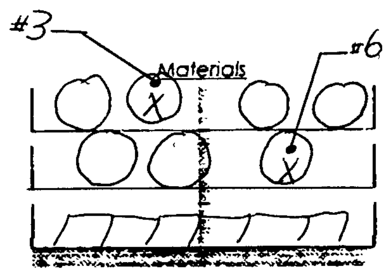
Initial Wt. (lbs)	Final Wt. (lbs)

**** Secure pipe to prevent pipes from rolling**

#2 Rack B's Characteristics. 430 LBS

ƎR 1554
ƎR 1507

Initial Wt. (lbs)	Final Wt. (lbs)
STEEL PIPE 240 LBS	240 LBS
CLAY PIPE 204 LBS	204 LBS

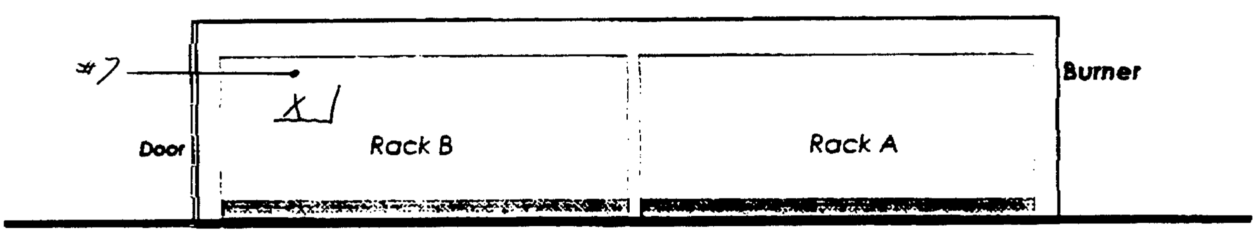


Take Pictures

Initial Wt. (lbs)	Final Wt. (lbs)
CINDER BLOCK 680 LBS	633 LBS

**** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

] **Mark Locations of Thermocouples**



] **Roll Calls and Close Furnace Door**

[signature]
[signature]
[signature]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

] **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

Date: 6 March 96
Time:

Test #: 16A
Rmp-Up ~~Time~~ Rate: 300°/HR
Soak Time: None
Soak Temp: 600°

AFTERBURNER START-UP

Initial and record time for each item.

- [JH] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- [JH] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- [JH] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [JH] **Start "DATALOGGER" Pushbuttons on the Computer.**
- [JH] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ________ :Time
@ 1200 F: ________ :Time
@ 1800F: ________ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature
1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- [JH] **Set Bleed Air Damper to 75%**
- [JH] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- [JH] **Set Controller to "MANUAL". Set controller output to 0.0**
- [JH] **Turn Furnace Key to "BURNER" Position.**
- JH **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- [JH] **Open Bleed Air Valve to ~~100%~~** 75%
- [JH] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
  Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- [JH] **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- [JH] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [JH] **STOP "OXIDIZER" and "AIR BLOWER"**
- [JH] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

HOURLY DATALOG (of)

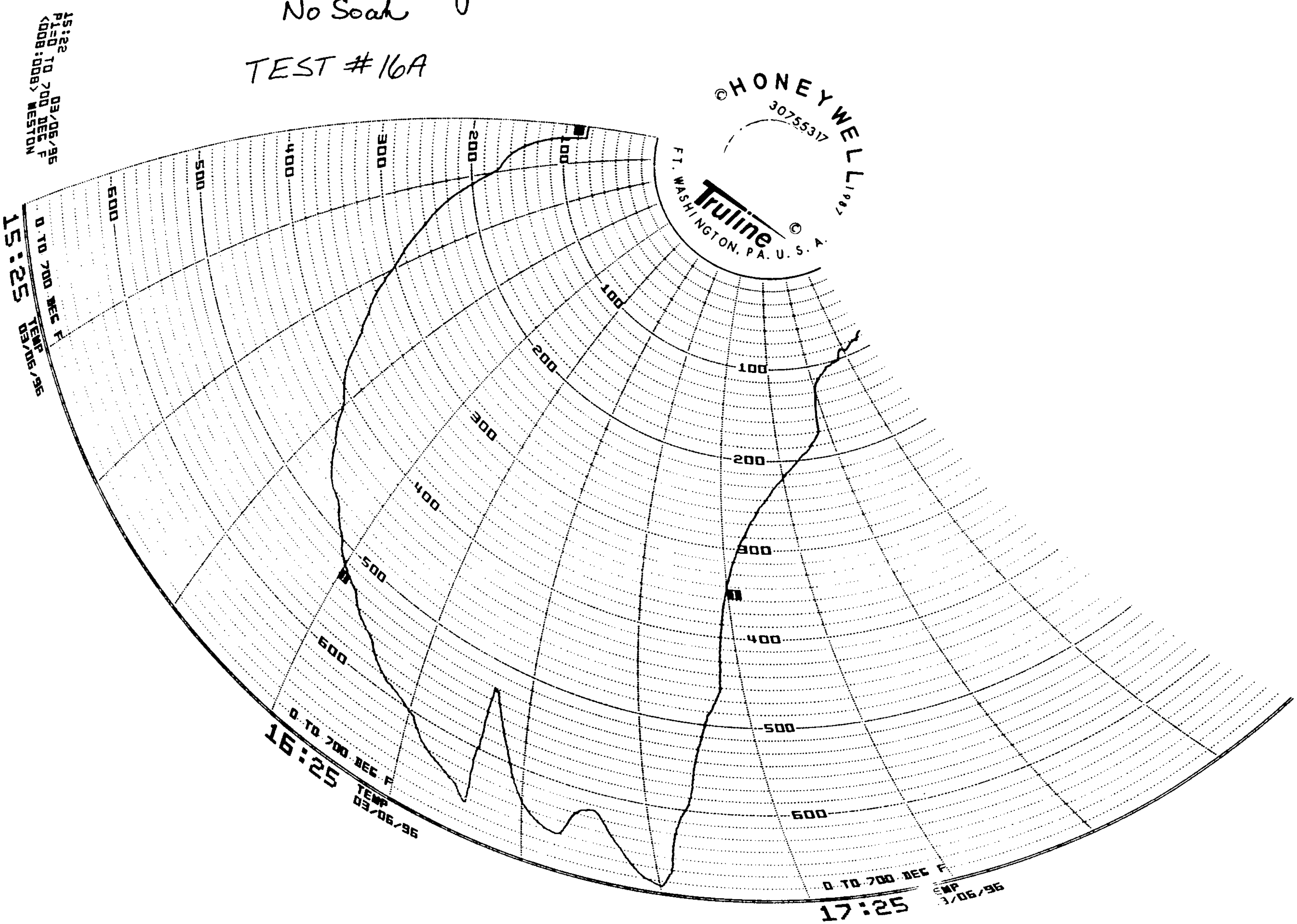
Date: 6 March 96
Time:

Test Number: 16A
Ramp-Up Rate: 300°/HR
Soak Time: None
Soak Temp: 600°

Tag	Description	Unit	1600	1700
		Time:		
FURNACE				
PIT-232	Fuel Gas Pressure	In.WC	10.09	11.29
FIT-231	Fuel Gas Flow	CFH	98	196
PIT-222	Combustion Air Pressure	In.WC	22.9	23.20
FIT-221	Combustion Air Flow	CFH	9798	9600
PIT-158	Chamber Pressure	In.WC	-.23	-.21
TIT-201	Recorder Temperature	Deg.F	302	657
TIT-202	Furnace Exit Gas Temp (Control) measured in Exit Duct	Deg.F	222	520
TIT-203	Material Thermocouple #1	Deg.F	270	693
TIT-204	Material Thermocouple #2	Deg.F	172	388
TIT-205	Material Thermocouple #3	Deg.F	218	527
TIT-206	Material Thermocouple #4	Deg.F	298	677
TIT-207	Material Thermocouple #5	Deg.F	312	732
	Material Temp Avg.	Deg F.	254	602
AFTERBURNER				
TIT-131	Combustor Burner Temp. Control	Deg. F	1850	1848
FIT-149	Fumes Flow	PPH ~~SCFM~~	2338	2225
PIT-151	Fumes Pressure (Furnace Draft)	InWC	.40	.29
TIT-145	Combustor Temperature	Deg. F	1857	1850
PIT-133	Fuel Pressure	PSIG	.62	.39
TIT-121	Fuel Gas Flow	CFM	915	638
TIT-100	ID Fan Inlet Gas Temp.	Deg F.	204	493
CEM				
NOx-B	Interconnecting Duct NOx	ppm	7.8	14.7
THC-B	Interconnecting Duct THC	ppm	39.3	23.3
CO	Stack's CO	ppm	.5	.5
THC	Stack's THC	ppm	-.3	-.2
~~NOx~~ NO	~~Stack's NOx~~ Duct NO	ppm	6.4	16.2
SO2	Stack SO2	ppm	3.5	3.0
	Stack's O2	%	10.18	8.8
CO2	Stack's CO2	%	6.04	6.96
TIT-300	Ambient Temp	Deg. F	76	69
	Relative Humidity	%	75	96

600°F treatment temp
300°F/hr ramp
No Soak

TEST #16A



Pre - START-UP (1 of 3)

Date: 6 MAR '96
Time:

Test Number: 168
Ramp-Up Rate: 300°F/hr
Soak Time: 0 hrs
Soak Temp: 600°F

MECHANICAL

Initial each item.

- [GH] **Inspection doors/manways are SECURED**
- [GH] **Gas Valves OPEN**
- [GH] **View/Inspection Ports CLOSED**
- [ ] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [GH] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [GH] **Furnace and Afterburner Control Breakers are ON.**
- [GH] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [GH] **BUMP Motors and switch to "AUTO"**
  - ____ *Furnace Combustion Blower (M-220)*
  - ____ *Afterburner Combustion Blower (M-130)*
  - ____ *Afterburner I.D Fan (M-158)*
  - ____ *Place Afterburner Switch in REMOTE*

Verify field selector switchess are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [GH] **Calibrate CEM**

Done PM

	Tank Values	Recorded Values	Adjustment (Y/N)
____ *Interconnecting Duct - NOx*			
____ *Interconnecting Duct - THC*			
____ *Stack NOx*			
____ *Stack SO2*			
____ *Stack THC*			
____ *Stack CO*			
____ *Stack O2*			
____ *Stack CO*			

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [TJB] **Datalogger/Computer is ON**
  - ____ *Record Time (Computer Clock)*
  - ____ *Record Ambient Temperature (TT-300)*
  - ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

- [GH] **Pre - Spike Activities**
  - ✓ *Lock-out all Motors: Complete Exclusion Log*
  - ✓ *Secure Equipment Pad and Access Road w/ Chains*
  - ✓ *Spike Test Materials and Furnace Test Plates*

Test Number 16 B

Ramp-Up Rate:

Soak Time:

Soak Temp:

ADING/UNLOADING (2 of 3)

Date: 6 MARCH 96

Time:

LD ACTIVITIES ALL Spike TET

Initial each item.

] **Load Furnace with Materials and Thermocouples** ✓

For each rack bin, provide a description in terms of contents, appearance, moisture, etc

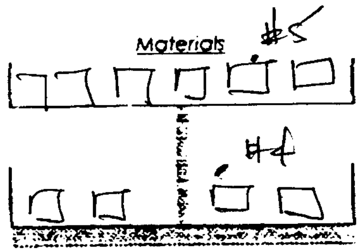
**** Refer to loading procedures for instructions.**

Rack A's Characteristics. 600 lbs

BEFORE 1500

AFTER 1487

Initial Wt.(lbs)	Final Wt.(lbs)	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
1317 lbs				



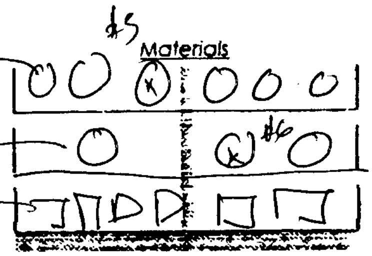
**** Secure pipe to prevent pipes from rolling**

#2 Rack B's Characteristics.

BEFORE 1500

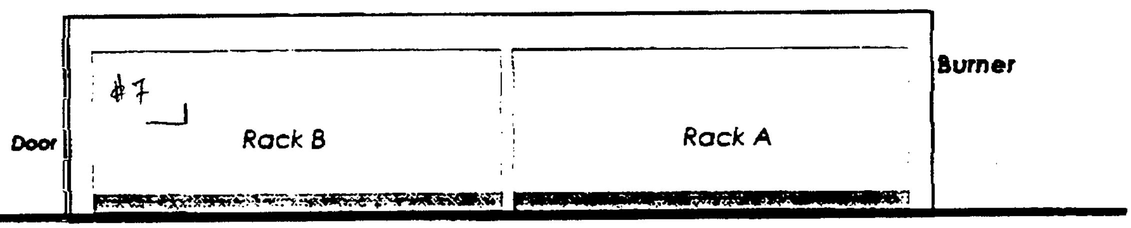
AFTER 1496

Initial Wt.(lbs)	~~Final Wt.(lbs)~~	Materials	Initial Wt.(lbs)	Final Wt.(lbs)
Steel	240 lbs			
Clay 204 lbs				
~~680~~	633 lbs			



**** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

] **Mark Locations of Thermocouples**



~~] **Roll Calls and Close Furnace Door**~~

[signature] Tom Baer

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

] **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

START-UP (3 of 3)

Date: ___________ Rmp-Up Time: ___________

Time: ___________ Soak Time: ___________

Soak Temp: ___________

...RBURNER START-UP

Initial and record time for each item.

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

> *Once the burner has started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ________ :Time

@ 1200 F: ________ :Time

@ 1800F: ________ :Time

> *Once the burner is at low fire, burner control will be released to the operator.*
> *The operator must adjust gas flow and ID fan speed to maintain temperature*
> *1800°F and system draft @ <-0.5 In WC.*

FURNACE START-UP

Initial and record time for each item.

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

> *Once the burner started, the control system will initiate a purge sequence.*
> *The pilot will then attempt to light the burner at low fire.*

- **Open Bleed Air Valve to 100%**
- **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

> *Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC. afterburner temp @ 1800 Deg F. and furnace temp @ SOAK temperature.*

- **Manually Log Operating Parameters.**

> *Use the attached Log Sheet to record all operating parameters at least hourly.*
> *SOAK TIMES and TEMPERATURES will vary from test to test.*

**** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS**

COOL-DOWN

Initial and record time for each item.

- **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- **STOP "OXIDIZER" and "AIR BLOWER"**
- **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

**** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.**

HOURLY DATALOG (of)

Date: 6 MAR. 96

Time:

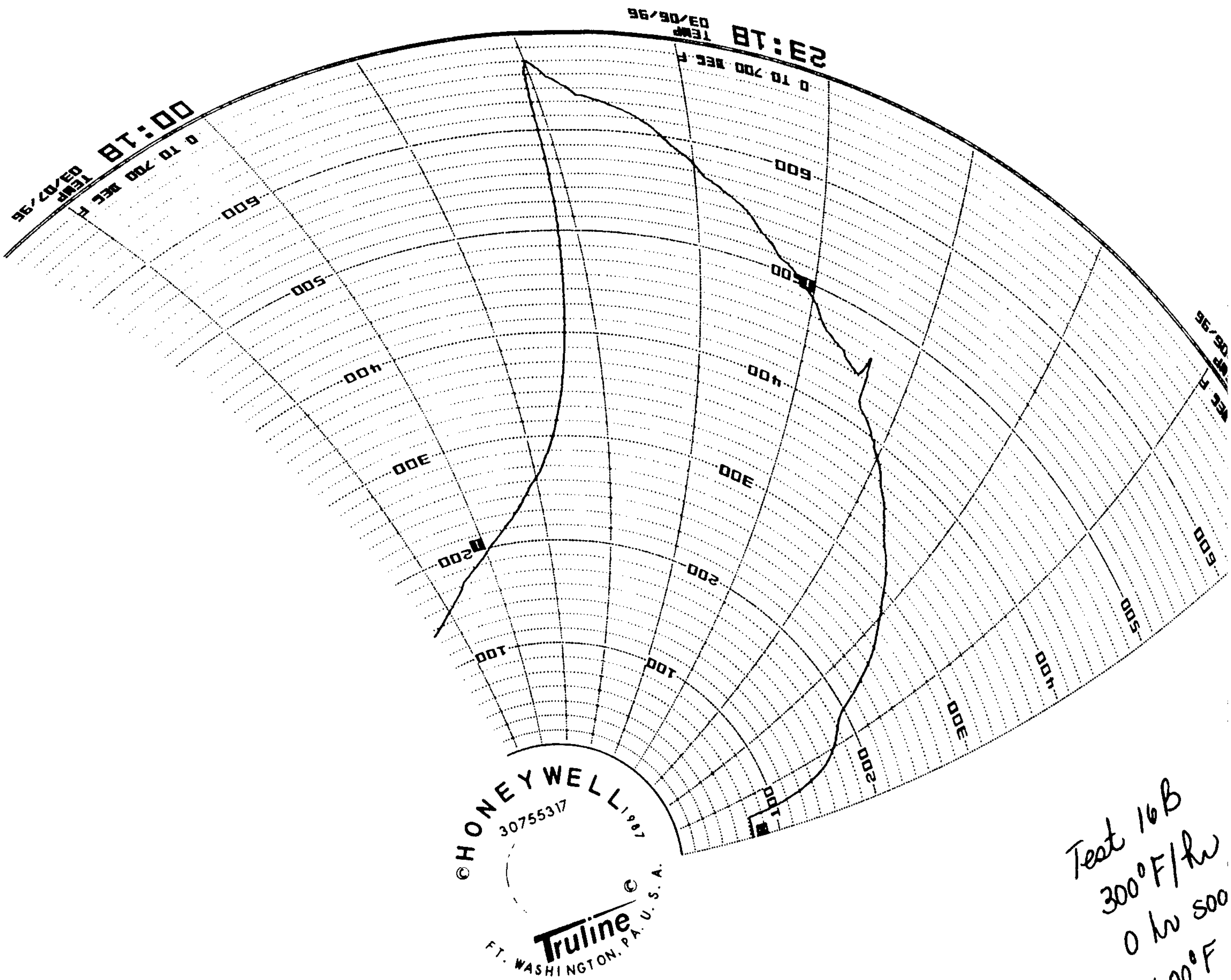
Test Number: 16 B

Ramp-Up Rate: 300°/hr

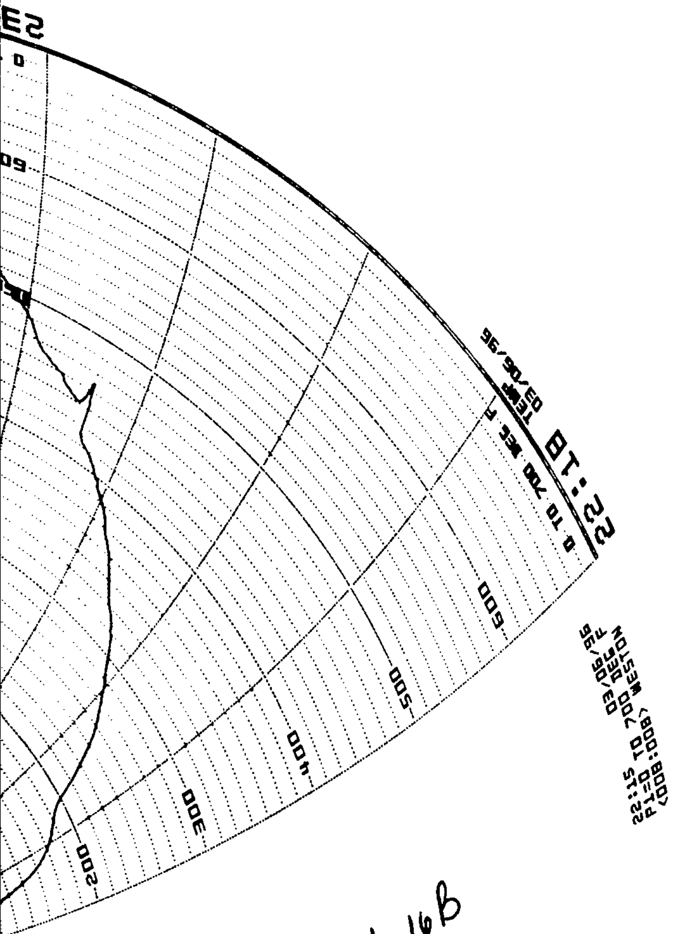
Soak Time: 0

Soak Temp: 600 °F

Tag	Description	Unit	2360	00
		Time:		
FURNACE				
PIT-232	Fuel Gas Pressure	In.WC	10.36	11.50
FIT-231	Fuel Gas Flow	CFH	93	190
PIT-222	Combustion Air Pressure	In.WC	23.44	23.49
FIT-221	Combustion Air Flow	CFH	9913	9681
PIT-158	Chamber Pressure	In.WC	-0.16	-.14
TIT-201	Recorder Temperature	Deg.F	230	659
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	231	506
TIT-203	Material Thermocouple #1	Deg.F	275	569
TIT-204	Material Thermocouple #2	Deg.F	205	281
TIT-205	Material Thermocouple #3	Deg.F	271	346
TIT-206	Material Thermocouple #4	Deg.F	286	466
TIT-207	Material Thermocouple #5	Deg.F	313	328
	AVG. TEMP		282	385
AFTERBURNER	TIT 201 EXIT GAS		327	833
	TIT 100 INLET GAS		229	307
TIT-131	Combustor Burner Temp. Control	Deg. F	1823	1802
FIT-149	Fumes Flow	CFM	2143	3444
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.33	1.51
TIT-145	Combustor Temperature	Deg. F	1831	1803
PIT-133	Fuel Pressure	PSIG	0.52	0.82
TIT-121	Fuel Gas Flow	CFM	810	1098
CEM				
NOx-B	Interconnecting Duct NOx	ppm	2.6	0.6
THC-B	Interconnecting Duct THC	ppm	38.1	28
CO	Stack's CO	ppm	0.5	1.0
THC	Stack's THC	ppm	-0.8	-0.1
NOx	Stack's NOx	ppm		1.5
SO2	Stack SO2	ppm	1.5	1.5
?	Stack's O2	%	10.77	14.15
CO2	Stack's CO2	%	5.84	4.98
TIT-300	Ambient Temp	Deg. F	64	54
Weather Service	Relative Humidity		99	100



Test 16B
300°F/hr
0 hr soo
600°F



Test 16B
300°F/hr
0 hr soak
600°F Soak Temp

Pre - START-UP (1 of 3)

Date: 7 MARCH 96
Time:

Test Number: 16 C ROX
Ramp-Up Rate: 300°F/hr
Soak Time: 0
Soak Temp: 600°F

MECHANICAL

Initial each item.

- [✓] **Inspection doors/manways are SECURED**
- [✓] **Gas Valves OPEN**
- [✓] **View/Inspection Ports CLOSED**
- [67%] **Record Gas (Propane) Valve Position** 68.5%

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [AH] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [AH] **Furnace and Afterburner Control Breakers are ON.**
- [AH] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [AH] **BUMP Motors and switch to "AUTO"**
  - ✓ *Furnace Combustion Blower (M-220)*
  - ✓ *Afterburner Combustion Blower (M-130)*
  - ✓ *Afterburner I.D Fan (M-158)*
  - ✓ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [AH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	Y
✓ Interconnecting Duct - THC	31.1	31	Y
✓ ~~Stack NOx~~ Duct NO	75.6	75	Y
✓ Stack SO2	126.4	126	Y
✓ Stack THC	31.1	31	Y
✓ Stack CO	124.0	124	N
✓ Stack O2	5.97	6.0	N
✓ Stack CO2	4.89	4.9	N

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [AH] **Datalogger/Computer is ON**
  - ____ *Record Time (Computer Clock)*
  - ____ *Record Ambient Temperature (TIT-300)*
  - ____ *Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)*

- [DRG] **Pre - Spike Activities**
  - ✓ *Lock-out all Motors; Complete Exclusion Log*
  - ✓ *Secure Equipment Pad and Access Road w/ Chains*
  - ✓ *Spike Test Materials and Furnace Test Plates*

LOADING/UNLOADING (2 of 3)

Date: ______________________

Time: ______________________

Test Number ______________________

Ramp-Up Rate: ______________________

Soak Time: ______________________

Soak Temp: ______________________

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc.

**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics.

START 1500 LBS

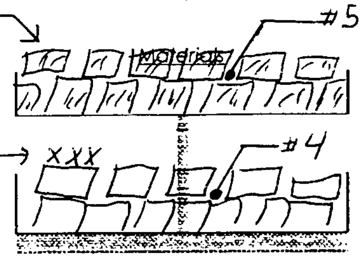
AFTER ____ LBS

600 LB

Initial Wt.(lbs) Final Wt.(lbs)

CINDER BLOCK 1400 LBS ______

ROX



Initial Wt.(lbs) Final Wt.(lbs)

______ ______

______ ______

** Secure pipe to prevent pipes from rolling

Take Pictures ______

#2 Rack B's Characteristics.

START 1500 LBS

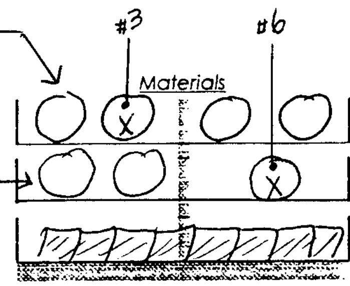
AFTER ____ LBS

430 LBS

Initial Wt.(lbs) Final Wt.(lbs)

STEEL PIPE 240 LBS ______

CLAY PIPE 204 LBS ______



Initial Wt.(lbs) Final Wt.(lbs)

______ ______

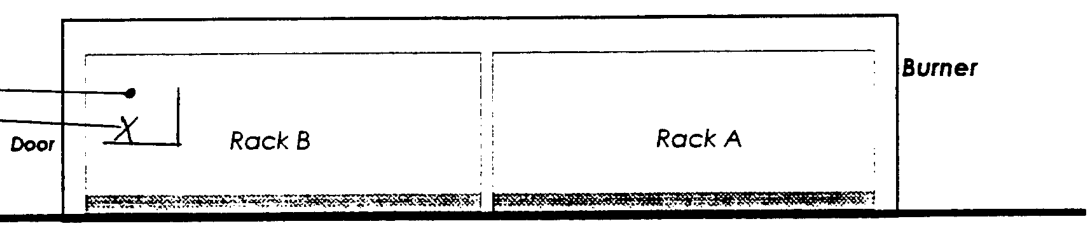
CINDER BLOCK 626 LBS ______

Take Pictures ______

** **SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**

#7
ROX



☐ **Roll Calls and Close Furnace Door**

____

____

____

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

***** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE***

START-UP (3 of 3)

Date: ______________ Rmp-Up Time: ______________

Time: ______________ Soak Time: ______________

Soak Temp: ______________

:RBURNER START-UP

Initial and record time for each item.

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time
@ 1200 F: ______ :Time
@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Open Bleed Air Valve to 100%**
- **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

- **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- **STOP "OXIDIZER" and "AIR BLOWER"**
- **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

**** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.**

HOURLY DATALOG (__ of __)

Date: 7 MARCH 96

Time:

Test Number: 16 C RDX

Ramp-Up Rate: 300°/HR

Soak Time: 0

Soak Temp: 600°F

Tag	Description	Unit	1300		1345	1500
		Time:				

FURNACE

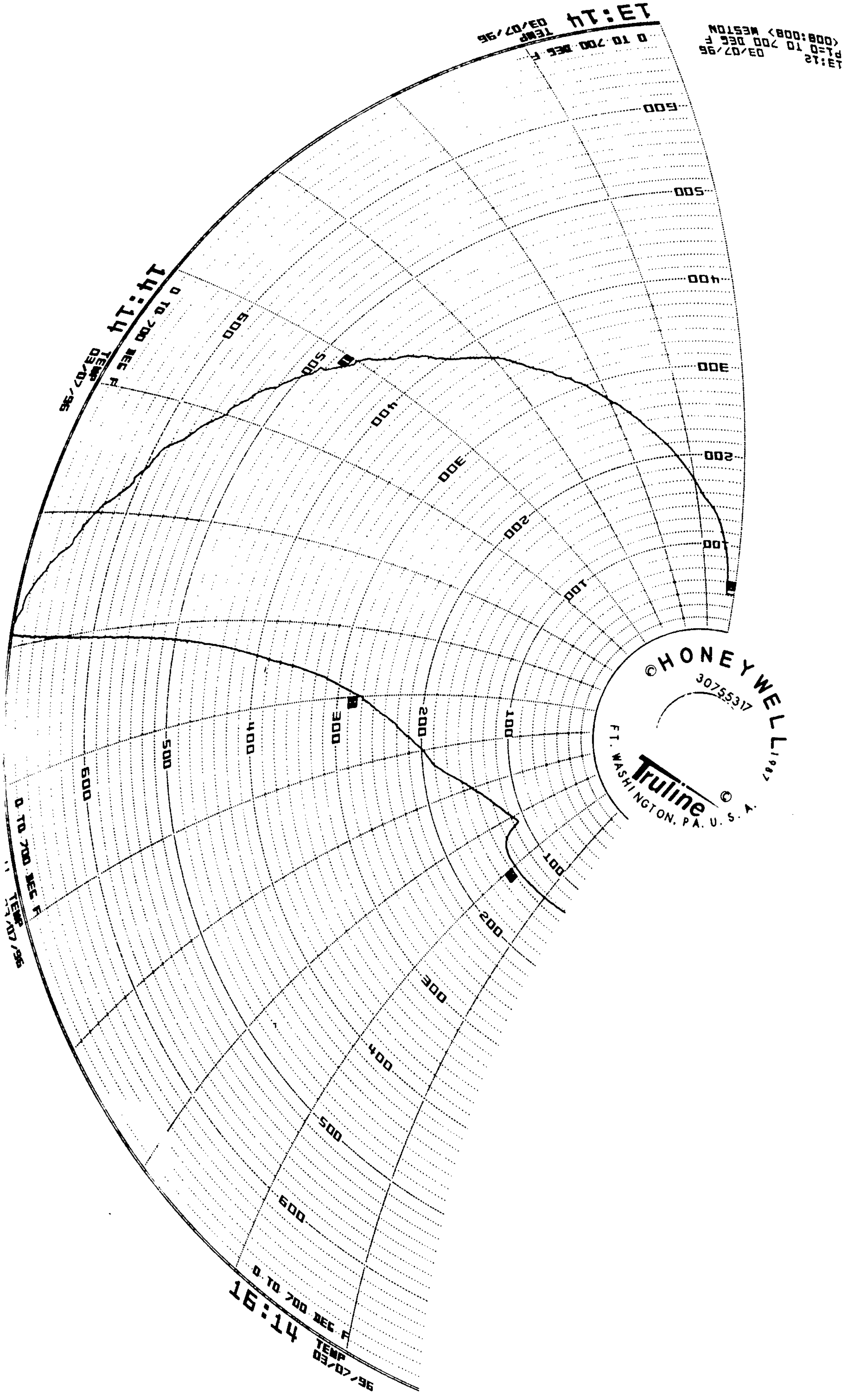
Tag	Description	Unit	1300		1345	1500
PIT-232	Fuel Gas Pressure	In.WC	3.83		12.47	12.63
FIT-231	Fuel Gas Flow	CFH	0		195	202
PIT-222	Combustion Air Pressure	In.WC	24.21		25.41	25.47
FIT-221	Combustion Air Flow	CFH	(224)		9977	9963
PIT-158	Chamber Pressure	In.WC	-.31		-.14	-.14
TIT-201	Recorder Temperature	Deg.F	46		627	701
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	44		503	570
TIT-203	Material Thermocouple #1	Deg.F	49		480	774
TIT-204	Material Thermocouple #2	Deg.F	50		266	312
TIT-205	Material Thermocouple #3	Deg.F	46		528	598
TIT-206	Material Thermocouple #4	Deg.F	92		661	730
TIT-207	Material Thermocouple #5	Deg.F	43		667	719
			46		561	620

AFTERBURNER

Tag	Description	Unit	1300		1345	1500
TIT-131	Combustor Burner Temp. Control	Deg. F	1412		1846	1824
FIT-148	Fumes Flow	CFM	2335		2046	2030
PIT-151	Fumes Pressure ~~(Furnace Draft)~~	InWC	.46		.45	.27
TIT-145	Combustor Temperature	Deg. F	1479		1841	1813
PIT-133	Fuel Pressure	PSIG	.84		.45	.38
TIT-121	Fuel Gas Flow	CFM	1103		632	627

CEM

Tag	Description	Unit	1300		1345	1500
NOx-B	Interconnecting Duct NOx	ppm	-.2		9.1	6.1
THC-B	Interconnecting Duct THC	ppm	10.4		29.0	41.8
CO	Stack's CO	ppm	1.5		.5	.5
THC	Stack's THC	ppm	5.0		.9	.9
~~NOx~~ NO	~~Stack's NOx~~ Duct NO	ppm	-.4		10.3	4.1
SO2	Stack SO2	ppm	3.5		2.0	2.0
	Stack's O2	%	12.38		9.8	12.05
CO2	Stack's CO2	%	5.44		7.28	5.72
TIT-300	Ambient Temp	Deg. F	36			35
Weather Service	Relative Humidity	%	90			86



Test 16 C
300°F/hr ramp
0 - Soak
600°F Soak Temp

Pre - START-UP (1 of 3)

Date: 3-7-96
Time:

Test Number: 26D
Ramp-Up Rate: 300°F/hr
Soak Time: 0
Soak Temp: 600°F

MECHANICAL

Initial each item.

- [✓] **Inspection doors/manways are SECURED**
- [✓] **Gas Valves OPEN**
- [✓] **View/Inspection Ports CLOSED**
- [ ] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [GH] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [GH] **Furnace and Afterburner Control Breakers are ON.**
- [GH] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [GH] **BUMP Motors and switch to "AUTO"**
  - ______ Furnace Combustion Blower (M-220)
  - ______ Afterburner Combustion Blower (M-130)
  - ______ Afterburner I.D Fan (M-158)
  - ______ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

- [GH] **Calibrate CEM**

  D/C in the A.M.

	Tank Values	Recorded Values	Adjustment (Y/N)
______ Interconnecting Duct - NOx			
______ Interconnecting Duct - THC			
______ Stack NOx			
______ Stack SO2			
______ Stack THC			
______ Stack CO			
______ Stack O2			
______ Stack CO			

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [HB] **Datalogger/Computer is ON**
  - ______ Record Time (Computer Clock)
  - ______ Record Ambient Temperature (TIT-300)
  - ______ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

- [TD] **Pre - Spike Activities**
  - ______ Lock-out all Motors: Complete Exclusion Log
  - ______ Secure Equipment Pad and Access Road w/ Chains
  - ______ Spike Test Materials and Furnace Test Plates

Date: ______

Time: ______

Ramp-Up Rate: ______

Soak Time: ______

Soak Temp: ______

FIELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc
** **Refer to loading procedures for instructions.**

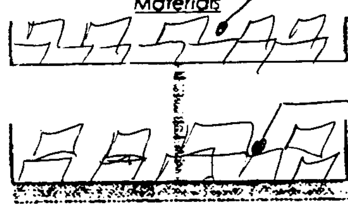
#1 Rack A's Characteristics.

Initial Wt. (lbs)	Final Wt. (lbs)
1989 ~~1497~~ lb	

Materials

#5

#4



Take Pictures

Initial Wt. (lbs)	Final Wt. (lbs)

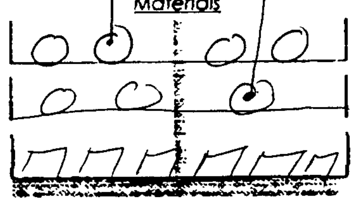
** *Secure pipe to prevent pipes from rolling*

#2 Rack B's Characteristics.

Initial Wt. (lbs)	Final Wt. (lbs)
1497 ~~1489~~ lb	

#3 #6

Materials



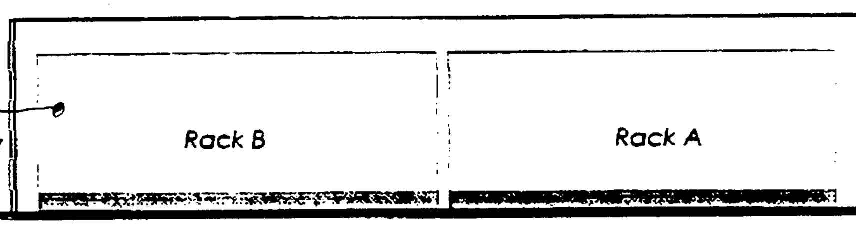
Take Pictures

Initial Wt. (lbs)	Final Wt. (lbs)

** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks*
CP-Comtaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**

#7



☒ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

[signature]

☐ **Complete Spike Sample Weigh Sheet**

** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE

START-UP (3 of 3)

Date: ______________

Time: ______________

Rmp-Up Time: ______________

Soak Time: ______________

Soak Temp: ______________

..RBURNER START-UP

Initial and record time for each item.

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time

@ 1200 F: ______ :Time

@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Open Bleed Air Valve to 100%**
- **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

*** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS*

COOL-DOWN

Initial and record time for each item.

- **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- **STOP "OXIDIZER" and "AIR BLOWER"**
- **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

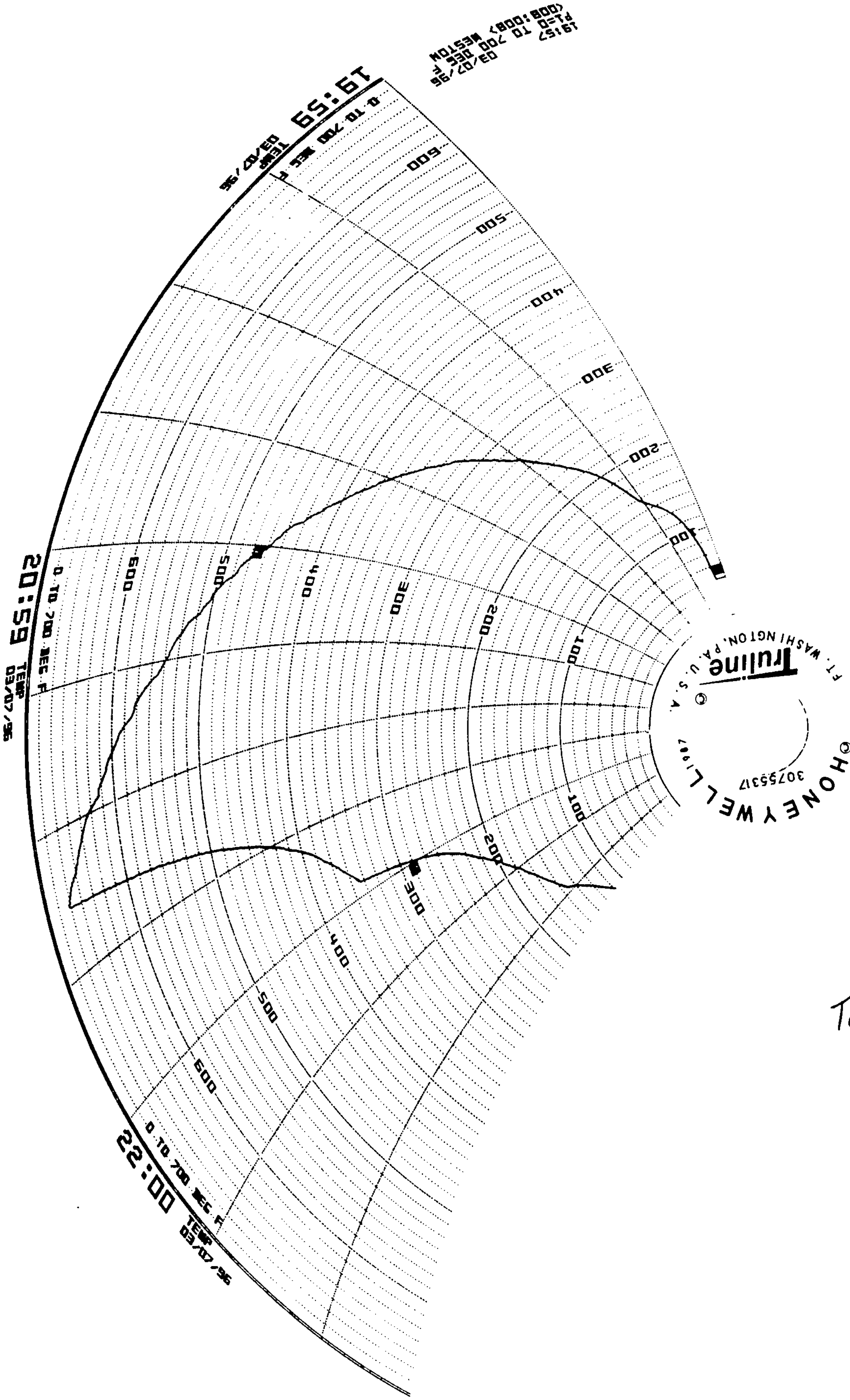
*** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.*

HOURLY DATALOG (__ of __)

Date: 7 MAR 96
Time:

Test Number: 16D
Ramp-Up Rate: 300°F /hr
Soak Time: 8
Soak Temp: 600°F

Tag	Description	Unit	2160	22
		Time:		
FURNACE				
PIT-232	Fuel Gas Pressure	In.WC	12.25	9.76
FIT-231	Fuel Gas Flow	CFH	136	58
PIT-222	Combustion Air Pressure	In.WC	25.25	25.4
FIT-221	Combustion Air Flow	CFH	10141	10789
PIT-158	Chamber Pressure	In.WC	-.14	-.42
TIT-201	Recorder Temperature	Deg.F	443	365
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	342	313
TIT-203	Material Thermocouple #1	Deg.F	429	457
TIT-204	Material Thermocouple #2	Deg.F	230	330
TIT-205	Material Thermocouple #3	Deg.F	313	410
TIT-206	Material Thermocouple #4	Deg.F	420	391
TIT-207	Material Thermocouple #5	Deg.F	447	335
	AVG.		373	383
AFTERBURNER				
TIT-131	Combustor Burner Temp. Control	Deg. F	1822	1816
FIT-149	Fumes Flow	CFM	2049	3468
PIT-151	Fumes Pressure (Furnace Draft)	InWC	0.29	1.53
TIT-145	Combustor Temperature	Deg. F	1802	1815
PIT-133	Fuel Pressure	PSIG	.47	.86
TIT-121	Fuel Gas Flow	CFM	660	1094
CEM				
NOx-B	Interconnecting Duct NOx	ppm	3.9	1.1
THC-B	Interconnecting Duct THC	ppm	40.8	43.8
CO	Stack's CO	ppm	0.5	1.0
THC	Stack's THC	ppm	0.8	0.8
NOx	~~Stack's NOx~~ DUCT NO	ppm	2.8	0.8
SO2	Stack SO2	ppm	2.5	2.5
	Stack's O2	%	11.40	13.39
CO2	Stack's CO2	%	6.34	13.28
TIT-300	Ambient Temp	Deg. F	30°	30
Weather Service	Relative Humidity		16	14



Test 16 D
300 °F/hr ramp
0 soak time
600°F treatment Temp

Pre - START-UP (1 of 3)

Date: 8 MAR 96
Time: 1050

Test Number: 12A
Ramp-Up Rate: 300°F/hr
Soak Time: 2 HRS
Soak Temp: 600 °F

MECHANICAL

Initial each item.

- [✓] **Inspection doors/manways are SECURED**
- [✓] **Gas Valves OPEN**
- [✓] **View/Inspection Ports CLOSED**
- [66%] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc. have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [JH] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [JH] **Furnace and Afterburner Control Breakers are ON.**
- [JH] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [JH] **BUMP Motors and switch to "AUTO"**
  - ✓ Furnace Combustion Blower (M-220)
  - ✓ Afterburner Combustion Blower (M-130)
  - ✓ Afterburner I.D Fan (M-158)
  - ✓ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations.

[JH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	Y
✓ Interconnecting Duct - THC	31.1	31	N
✓ ~~Stack NOx~~ Duct NO	75.6	75	N
✓ Stack SO2	126.	126	N
✓ Stack THC	31.1	31	N
✓ Stack CO	124.0	124.8	N
✓ Stack O2	5.97	6.0	N
✓ Stack CO2	4.89	4.9	N

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[JH] **Datalogger/Computer is ON**

- ____ Record Time (Computer Clock)
- ____ Record Ambient Temperature (TIT-300)
- ____ Record Ambient Humidity (call Weather Service 664-3010 or 945-7000)

[RJK] **Pre - Spike Activities**

- ✓ Lock-out all Motors: Complete Exclusion Log
- ✓ Secure Equipment Pad and Access Road w/ Chains
- ✓ Spike Test Materials and Furnace Test Plates

Test Number 17A
Ramp-Up Rate: 300°F/hr
Soak Time: 2hr
Soak Temp: 600°F

OADING/UNLOADING (2 of 3)

Date:
Time:

IELD ACTIVITIES

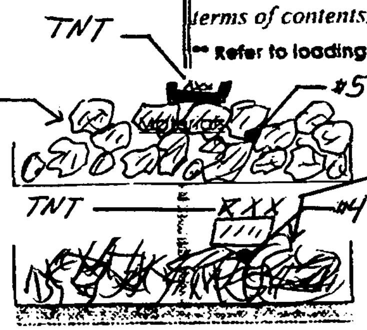
Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics 600LB
START 2102 LBS

Initial Wt.(lbs)	Final Wt.(lbs)
ROCK DEBRI FROM TESTS #11 354 LBS #15 354LBS TOTAL 708LBS	2028



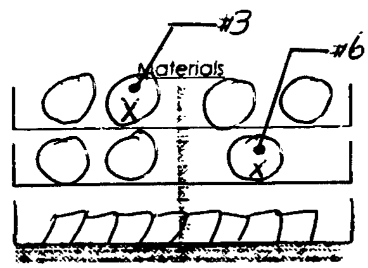
Take Pictures

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL DEB FROM TEST #11 434LBS #15 360LBS TOTAL 794 LBS	

**** Secure pipe to prevent pipes from rolling**

#2 Rack B's Characteristics 430 LB
~~ST~~ 1500 LBS

Initial Wt.(lbs)	Final Wt.(lbs)
STEEL PIPE 240LBS	1494
CLAY PIPE 204LBS	

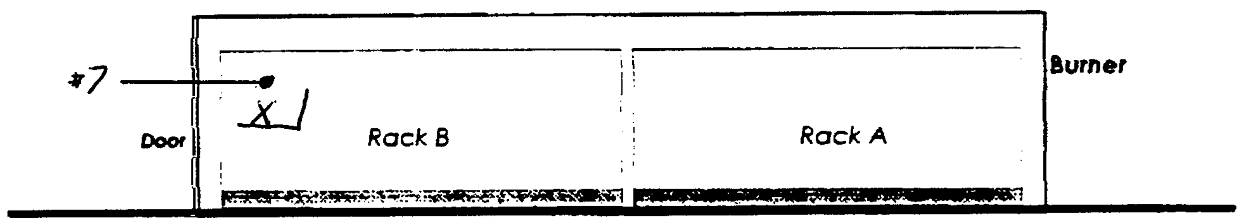


Take Pictures

Initial Wt.(lbs)	Final Wt.(lbs)
CINDER BLOCKS 626 LBS	

**** *SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Kevin J. Klingelhoeffer
Glen [illegible]

Verify all site personnel are accounted for.
Have each person initial this checklist at left.
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

START-UP (3 of 3)

Test # 17 A

Date: ______

Time: ______

Rmp-Up Time: ______

Soak Time: ______

Soak Temp: ______

...RBURNER START-UP

Initial and record time for each item.

JH **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**

JH **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**

JH **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

JH **Start "DATALOGGER" Pushbuttons on the Computer.**

JH **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time

@ 1200 F: ______ :Time

@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

FURNACE START-UP

Initial and record time for each item.

JH **Set Bleed Air Damper to 75%**

JH **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**

JH **Set Controller to "MANUAL". Set controller output to 0.0**

JH **Turn Furnace Key to "BURNER" Position.**

JH **Verify "INTERLOCK OK" light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

JH **Open Bleed Air Valve to 100%**

JH **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

JH **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

COOL-DOWN

Initial and record time for each item.

JB **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**

JB **STOP "OXIDIZER" and "AIR BLOWER"**

JB **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

**** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.**

HOURLY DATALOG (___ of ___)

Date: 8 MARCH 96

Time: ____________

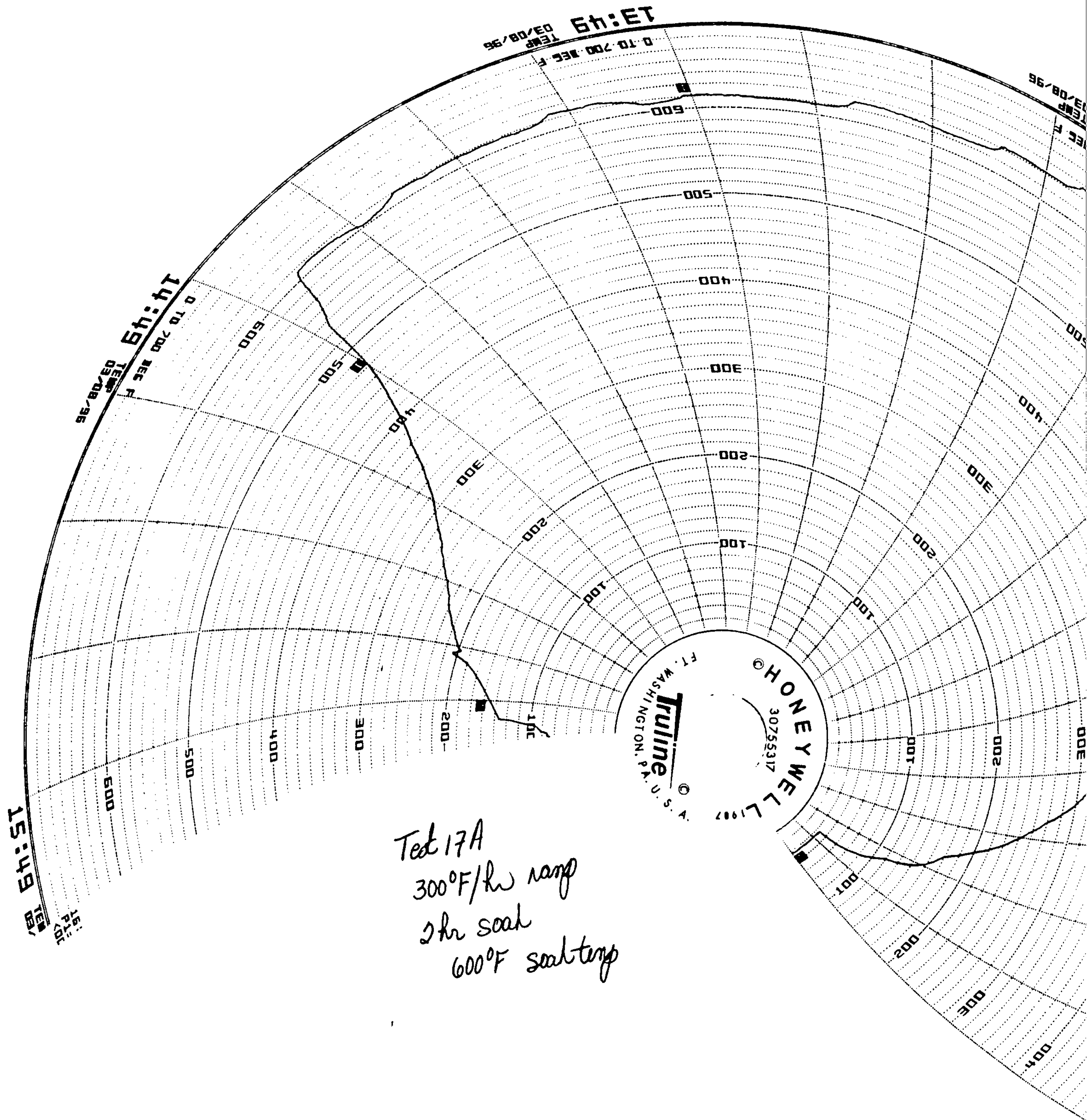
Test Number: 17A

Ramp-Up Rate: 300°/HR

Soak Time: 2 HRS

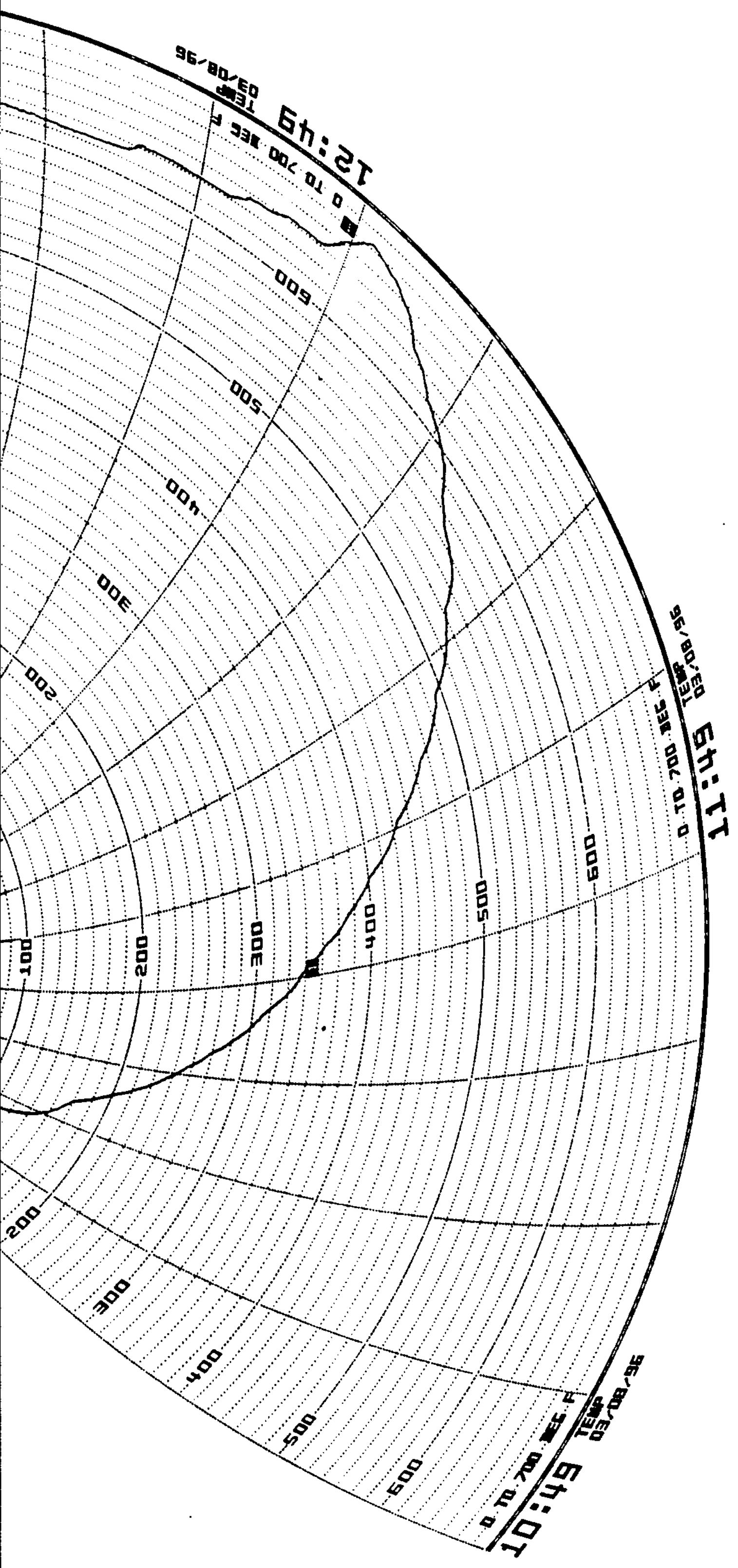
Soak Temp: 600°

Tag	Description	Unit	1100	1138 ~~1200~~	1200	1230	1300	1330	1400	1430	1500
Time:											
FURNACE											
PIT-232	Fuel Gas Pressure	In.WC	3.95	11.6	12.08	12.66	12.49	12.09	11.79	11.82	3.91
FIT-231	Fuel Gas Flow	CFH	0	99	129	180	163	138	123	120	2
PIT-222	Combustion Air Pressure	In.WC	24.72	25.86	25.91	25.85	25.76	25.69	25.71	25.63	24.35
FIT-221	Combustion Air Flow	CFH	12339	10377	10178	10080	10102	10119	10180	10178	12200
PIT-158	Chamber Pressure	In.WC	-.34	-.22	-.17	-.13	-.13	-.12	-.13	-.13	-.25
TIT-201	Recorder Temperature	Deg.F	32	261	380	562	646	622	609	613	402
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	33	205	301	456	543	547	545	551	373
TIT-203	Material Thermocouple #1	Deg.F	45	166	284	470	619	624	619	621	543
TIT-204	Material Thermocouple #2	Deg.F	29	160	248	412	545	575	577	575	462
TIT-205	Material Thermocouple #3	Deg.F	32	256	369	546	628	620	636	635	391
TIT-206	Material Thermocouple #4	Deg.F	32	252	366	543	627	611	594	599	377
TIT-207	Material Thermocouple #5	Deg.F	32	282	412	608	686	654	644	638	396
	Material Temp Avg		34	223	336	516	621	617	614	613	430
AFTERBURNER											
TIT-131	Combustor Burner Temp. Control	Deg. F	1452	1841	1827	1836	1820	1850	1839	1812	1827
FIT-149	Fumes Flow	CFM	2181	1989	2007	2008	2063	2060	2040	2032	2865
PIT-151	Fumes Pressure ~~(Furnace Draft)~~	InWC	.40	.26	.24	.21	.19	.20	.20	.22	.85
TIT-145	Combustor Temperature	Deg. F	1509	1841	1846	1842	1841	1837	1825	1820	1836
PIT-133	Fuel Pressure	PSIG	.85	.59	.53	.47	.38	.37	.32	.39	.74
TIT-121	Fuel Gas Flow	CFM	1096	815	769	656	623	600	508	631	972
TIT-100	Fan Inlet Temp		35	191		427	512	523	524	528	364
CEM											
NOx-B	Interconnecting Duct NOx	ppm	-1.1	2.5	6.2	16.2	11.9	7.1	7.0	7.0	1.9
THC-B	Interconnecting Duct THC	ppm	13.4	42.0	35.9	28.6	22.6	21.9	24.1	24.6	0.8
CO	Stack's CO	ppm	1.0	.5	0.0	0.5	.5	.5	0.0	0.0	0.0
THC	Stack's THC	ppm	.1	0.0	.1	.1	.2	.1	.1	.1	.1
~~NOx~~ NO	~~Stack's NOx~~ Duct	ppm	-14	.9	3.9	15.1	12.4	6.0	5.5	5.1	.6
SO2	Stack SO2	ppm	3.0	3.0	3.0	2.5	2.5	2.5	3.0	3.0	3.0
	Stack's O2	%	12.83	11.40	11.07	10.52	10.55	12.05	15.52	15.5	15.6
CO2	Stack's CO2	%	5.42	6.32	6.60	6.96	6.88	5.78	-.14	-.18	-.18
TIT-300	Ambient Temp	Deg. F	29	29	29		29	30	30	32	29
Weather Service	Relative Humidity	%	55	58	58		46	40	40	49	43



Test 17A
300°F/hr ramp
2hr soak
600°F soak temp

1


15:49
0 TO 700 DEG F
TEMP
03/08/96
11:49
0 TO 700 DEG F
TEMP
03/08/96
10:49
0 TO 700 DEG F
TEMP
03/08/96

Pre - START-UP (1 of 3)

Date: 9 MAR. 94

Time:

Test Number: 17B

Ramp-Up Rate: 300°F/hr

Soak Time: 2 hr

Soak Temp: 600°F

MECHANICAL

Initial each item.

- [✓] **Inspection doors/manways are SECURED**
- [✓] **Gas Valves OPEN**
- [✓] **View/Inspection Ports CLOSED**
- [ ] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [✓] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [✓] **Furnace and Afterburner Control Breakers are ON.**
- [✓] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [✓] **BUMP Motors and switch to "AUTO"**

____ *Furnace Combustion Blower (M-220)*
____ *Afterburner Combustion Blower (M-130)*
____ *Afterburner I.D Fan (M-158)*
____ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations

[TJB] **Calibrate CEM**

Cal in AM

	Tank Values	Recorded Values	Adjustment (Y/N)
____ Interconnecting Duct - NOx			
____ Interconnecting Duct - THC			
____ Stack NOx			
____ Stack SO2			
____ Stack THC			
____ Stack CO			
____ Stack O2			
____ Stack CO			

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

[TJB] **Datalogger/Computer is ON**

____ *Record Time (Computer Clock)*
____ *Record Ambient Temperature (TT-300)*
____ *Record Ambient Humidity (call Weather Service 663-3010 or 945-7000)*

[TJB] **Pre - Spike Activities**

____ *Lock-out all Motors: Complete Exclusion Log*
____ *Secure Equipment Pad and Access Road w/ Chains*
____ *Spike Test Materials and Furnace Test Plates*

Test Number 17B

Ramp-Up Rate:

Soak Time:

Soak Temp:

OADING/UNLOADING (2 of 3)

Date: 8th MAR. 94

Time:

IELD ACTIVITIES

Initial each item.

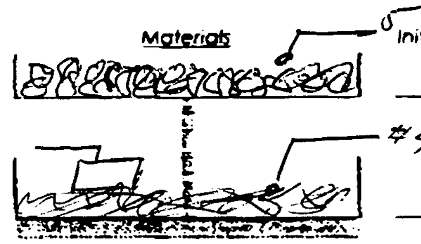
☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc

** **Refer to loading procedures for instructions.**

#1 Rack A's Characteristics

Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)
2028				
		pic Tin		

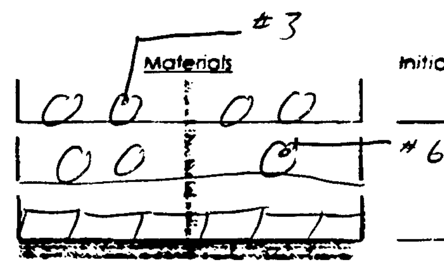


** **Secure pipe to prevent pipes from rolling**

Take Pictures

#2 Rack B's Characteristics

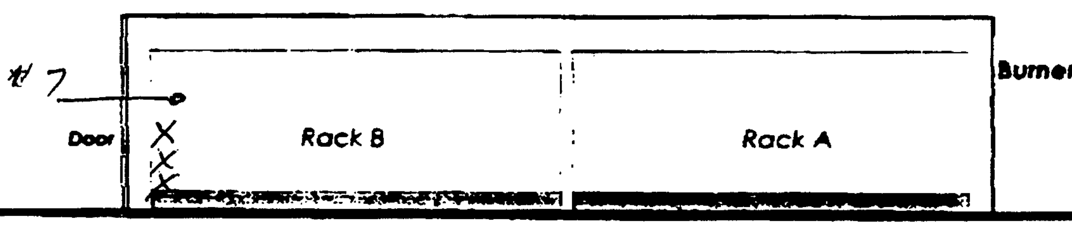
Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)
1494				



Take Pictures

** ***SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

** **SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

ate: ______ Rmp-Up Time: ______
me: ______ Soak Time: ______
Soak Temp: ______

BURNER START-UP — *Initial and record time for each item.*

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time
@ 1200 F: ______ :Time
@ 1800F: ______ :Time

Once the burner is at low fire, burner control will be released to the operator. The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

RNACE START-UP — *Initial and record time for each item.*

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Open Bleed Air Valve to 100%**
- **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC. afterburner temp @ 1800 Deg F. and furnace temp @ SOAK temperature.

- **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

OOL-DOWN — *Initial and record time for each item.*

- **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- **STOP "OXIDIZER" and "AIR BLOWER"**
- **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "K" OF HASP.***

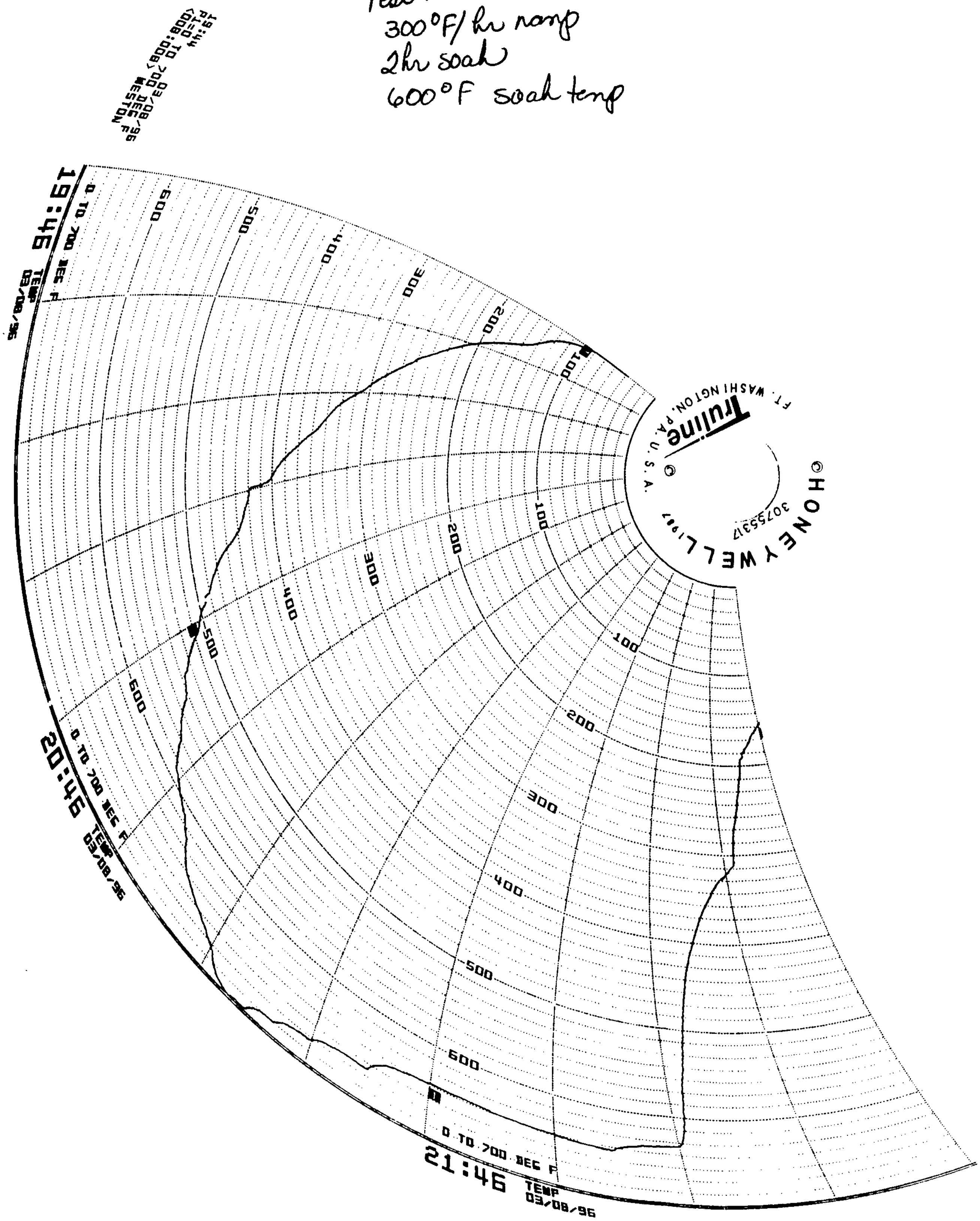
HOURLY DATALOG (of)

Date: 8 MAR. 96
Time:

Test Number: 17B
Ramp-Up Rate: 300°F/hr
Soak Time: 2 hr
Soak Temp: 600°F

Tag	Description	Unit	2000	2030	2100	2130	2200
		Time:					
FURNACE							
PIT-232	Fuel Gas Pressure	In.WC	11.09	1210	1285	1282	12.43
FIT-231	Fuel Gas Flow	CFH	77	111	167	155	129
PIT-222	Combustion Air Pressure	In.WC	26.27	26.36	26.42	26.45	26.43
FIT-221	Combustion Air Flow	CFH	10619	10375	10197	10213	10287
PIT-158	Chamber Pressure	In.WC	-.23	-.19	-.15	-.14	-.13
TIT-201	Recorder Temperature	Deg.F	195	349	565	679	641
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	156	262	436	554	549
TIT-203	Material Thermocouple #1	Deg.F	131	252	457	616	610
TIT-204	Material Thermocouple #2	Deg.F	178	309	507	632	604
TIT-205	Material Thermocouple #3	Deg.F	106	176	330	487	538
TIT-206	Material Thermocouple #4	Deg.F	203	339	544	656	630
TIT-207	Material Thermocouple #5	Deg.F	205	360	571	698	653
	MATERIAL TEMP AVG.		166	287	488	609	607
AFTERBURNER							
TIT-131	Combustor Burner Temp. Control	Deg. F	1835	1818	1817	1800	1824
FIT-149	Fumes Flow	CFM	2020	1998	2022	1998	2011
PIT-151	Fumes Pressure (Furnace Draft)	InWC	.31	.27	.26	.25	.25
TIT-145	Combustor Temperature	Deg. F	1839	1825	1827	1830	1834
PIT-133	Fuel Pressure	PSIG	.64	.52	.47	.35	.36
TIT-121	Fuel Gas Flow	CFM	855	745	638	534	560
TIT-100	FAN INLET TEMP.						525
CEM							
NOx-B	Interconnecting Duct NOx	ppm	0.4	2.3	4.7	5.2	3.2
THC-B	Interconnecting Duct THC	ppm	49.3	38.0	28.1	21.8	22.8
CO	Stack's CO	ppm	0.5	0.5	1.0	1.0	0.5
THC	Stack's THC	ppm	0.2	0.2	0.2	0.1	0.1
NOx	~~Stack's NOx~~ NO duct	ppm	-.2	1.5	3.7	4.5	3.2
SO2	Stack SO2	ppm	2.5	3.0	3.0	3.0	3.0
O2	Stack's O2	%	15.48	15.38	15.42	15.45	15.45
CO2	Stack's CO2	%	-.16	-.16	-.14	-.14	-.14
TIT-300	Ambient Temp	Deg. F	22		21		21
Weather Service	Relative Humidity	%	68		67		64

Test 17B
300°F/hr ramp
2hr soak
600°F soak temp



Pre - START-UP (1 of 3)

Date: 11 MAR 96
Time:

Test Number: 17C
Ramp-Up Rate: 300°F/hr
Soak Time: 2 HR
Soak Temp: 600°F

MECHANICAL

Initial each item.

- [TQB] **Inspection doors/manways are SECURED**
- [TQB] **Gas Valves OPEN**
- [TQB] **View/Inspection Ports CLOSED**
- [ ] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [TQB] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [TQB] **Furnace and Afterburner Control Breakers are ON.**
- [TQB] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [TQB] **BUMP Motors and switch to "AUTO"**
  - ____ Furnace Combustion Blower (M-220)
  - ____ Afterburner Combustion Blower (M-130)
  - ____ Afterburner I.D Fan (M-158)
  - ____ Place Afterburner Switch in REMOTE

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations

- [AH] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
✓ Interconnecting Duct - NOx	75.6	75	~~$~~ N
✓ Interconnecting Duct - THC	60.1	60	N
✓ ~~Stack NOx~~ Duct NO	75.6	75	Y
✓ Stack SO2	126.4	126	N
✓ Stack THC	60.1	60	N
✓ Stack CO	399.4	399	Y
✓ Stack O2	19.0	19.0	Y
✓ Stack CO2	19.0	19.0	Y

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [TQB] **Datalogger/Computer is ON**
  - ____ Record Time (Computer Clock)
  - ____ Record Ambient Temperature (TT-300)
  - ____ Record Ambient Humidity (call Weather Service 665-3010 or 945-7000)

- [ ] **Pre - Spike Activities**
  - ____ Lock-out all Motors: Complete Exclusion Log
  - ____ Secure Equipment Pad and Access Road w/ Chains
  - ____ Spike Test Materials and Furnace Test Plates

Test Number 17 C
Ramp-Up Rate:
Soak Time:
Soak Temp:

OADING/UNLOADING (2 of 3)

Date: 11 MAR 96
Time:

IELD ACTIVITIES

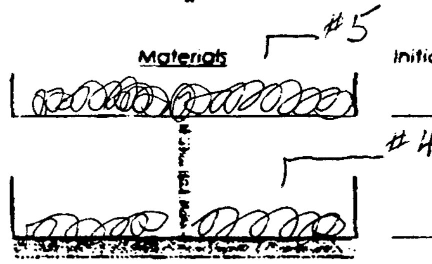
Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc
**** Refer to loading procedures for instructions.**

#1 Rack A's Characteristics

Initial Wt. (lbs)	Final Wt. (lbs)	Initial Wt. (lbs)	Final Wt. (lbs)
2028			

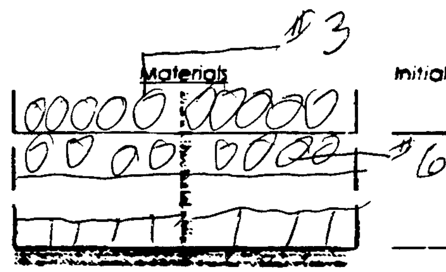


**** Secure pipe to prevent pipes from rolling**

Take Pictures

2 Rack B's Characteristics

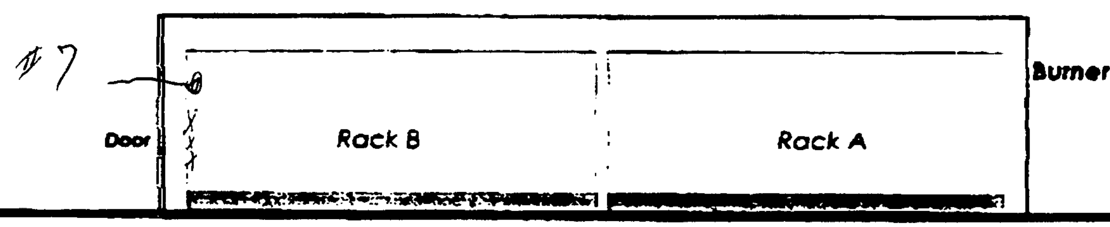
Initial Wt. (lbs)	Final Wt. (lbs)	Initial Wt. (lbs)	Final Wt. (lbs)
1494			



Take Pictures

**** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks**
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Tom Bar

Verify all site personnel are accounted for.
Have each person initial this checklist at left
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

ate: ______________ Rmp-Up Time: ______________
me: ______________ Soak Time: ______________
Soak Temp: ______________

BURNER START-UP

Initial and record time for each item.

- **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**
- **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**
- **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

- **Start "DATALOGGER" Pushbuttons on the Computer.**
- **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ______ :Time
@ 1200 F ______ :Time
@ 1800F ______ :Time

Once the burner is at low fire, burner control will be released to the operator. The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

RNACE START-UP

Initial and record time for each item.

- **Set Bleed Air Damper to 75%**
- **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**
- **Set Controller to "MANUAL". Set controller output to 0.0**
- **Turn Furnace Key to "BURNER" Position.**
- **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire

- **Open Bleed Air Valve to 100%**
- [ ] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's. Record Furnace temperatures during ramp-up hourly, on the control room log sheet.**

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

- [ ] **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

OOL-DOWN

Initial and record time for each item.

- [ ] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**
- [ ] **STOP "OXIDIZER" and "AIR BLOWER"**
- [ ] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

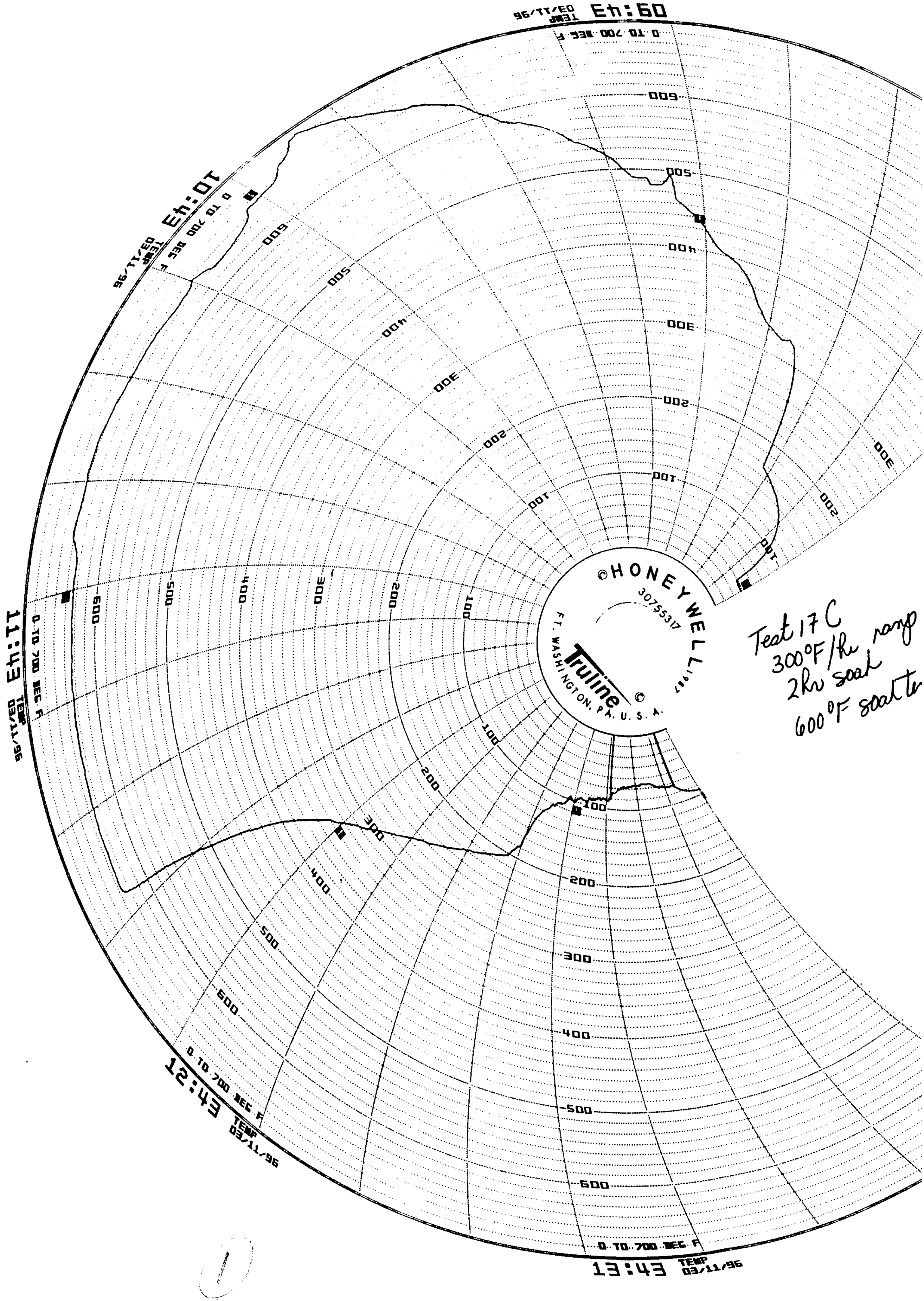
***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "R" OF HASP.***

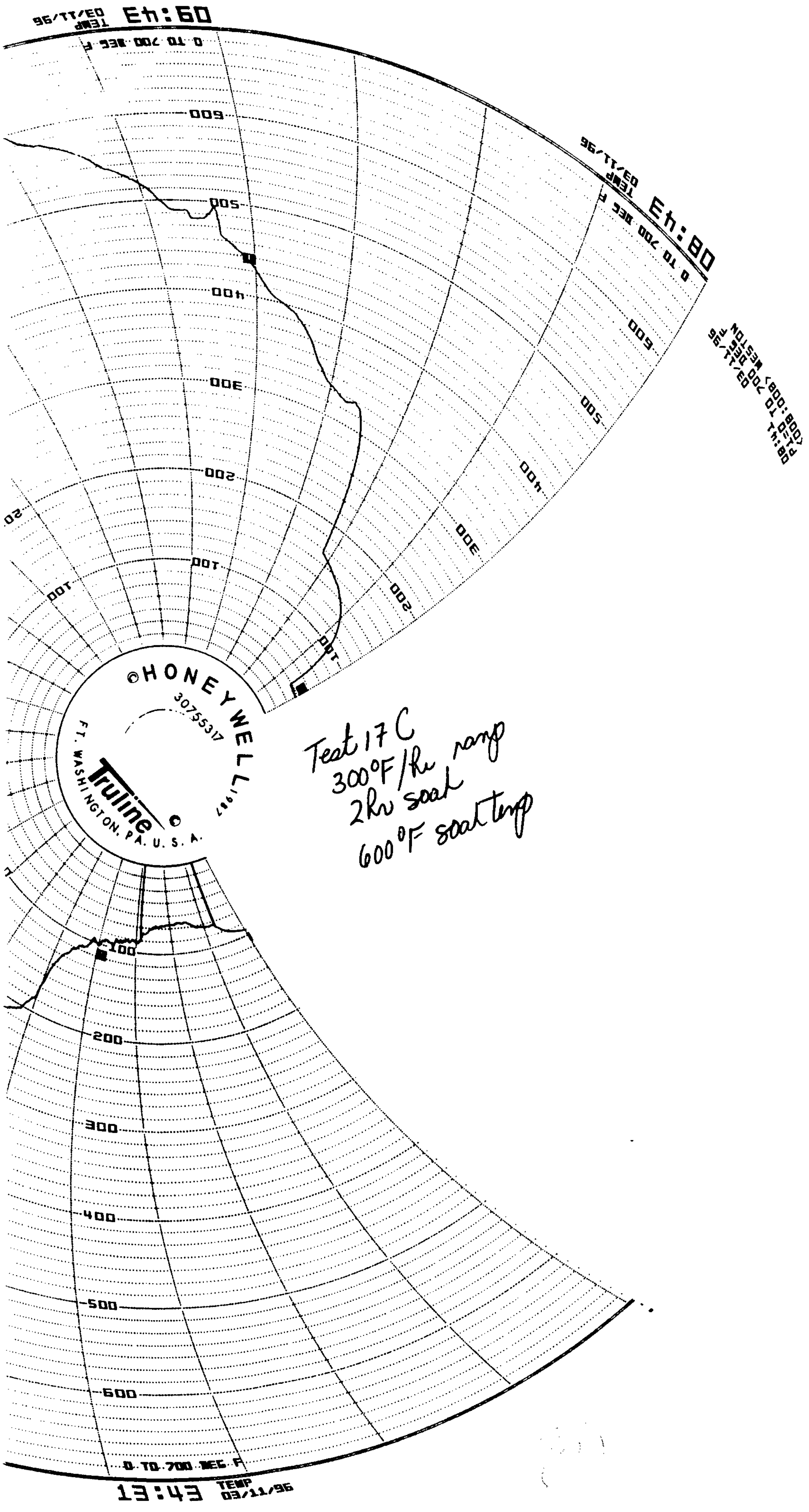
Test Number: 17C
Ramp-Up Rate: 300°F/hr
Soak Time: 2 hr
Soak Temp: 600°F

HOURLY DATALOG (of)

Date: 11 MAR 96
Time:

Tag	Description	Unit	0900	1000	1030	1100	1130	1200	1300
		Time:							
FURNACE									
PIT-232	Fuel Gas Pressure	in.WC	8.87	11.82	12.16	11.41	11.36	11.22	3.33
FIT-231	Fuel Gas Flow	CFH	43	141	180	123	122	115	.0
PIT-222	Combustion Air Pressure	in.WC	24.97	25.17	25.04	24.85	24.64	24.61	2.29
FIT-221	Combustion Air Flow	CFH	10886	10625	9939	10039	10011	10030	11933
PIT-158	Chamber Pressure	in.WC	-.38	-.22	-.20	-.18	-.19	-.18	-.52
TIT-201	Recorder Temperature	Deg.F	141	490	650	630	643	632	268
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	109	377	517	540	562	561	245
TIT-203	Material Thermocouple #1	Deg.F	96	392	644	674	624	611	300
TIT-204	Material Thermocouple #2	Deg.F	125	436	589	592	602	593	295
TIT-205	Material Thermocouple #3	Deg.F	75	282	425	515	576	594	458
TIT-206	Material Thermocouple #4	Deg.F	141	468	619	613	625	615	271
FIT-207	Material Thermocouple #5	Deg.F	140	521	687	647	620	646	257
	MATERIAL AVG. TEMP		115	420	592	610	616	611	331
AFTERBURNER									
TIT-131	Combustor Burner Temp. Control	Deg. F	1823	1819	1786	1800	1806	1805	1776
FIT-149	Fumes Flow	CFM	1980	2021	2010	2010	1989	2021	3275
PIT-151	Fumes Pressure (Furnace Draft)	InWC	-.23	.19	.19	.18	.19	.17	1.24
TIT-145	Combustor Temperature	Deg. F	1859	1827	1812	1808	1810	1811	1775
PIT-133	Fuel Pressure	PSIG	.64	.46	.38	.40	.32	.32	.82
TIT-121	Fuel Gas Flow	CFM	854	661	644	651	526	530	1094
TIT-100	FAN INLET TEMP.		109	356	480	513	535	536	244
CEM									
NOx-B	Interconnecting Duct NOx	ppm	4.4	9.2	9.8	7.5	7.4	7.0	2.3
THC-B	Interconnecting Duct THC	ppm	93.4	25.0	15.7	18.7	16.8	17.9	1.5
CO	Stack's CO	ppm	3.0	3.8	3.0	3.0	3.5	3.5	3.5
THC	Stack's THC	ppm	0.1	0.1	0.1	0.1	0.1	0.1	0.0
NOx	~~Stack's NOx~~ DUCT NO	ppm	0.8	4.6	6.4	4.1	4.3	4.1	-0.7
SO2	Stack SO2	ppm	1.5	1.5	1.5	1.5	1.5	1.5	1.5
O2	Stack's O2	%	13.85	12.73	12.17	13.85	13.85	14.00	16.13
CO2	Stack's CO2	%	7.52	8.22	8.78	7.78	7.20	6.78	5.63
TIT-300	Ambient Temp	Deg. F	48	49		49		50	
Weather Service	Relative Humidity		32	37		34		33	


©HONEYWELL 1987
30755317
Truline ©
FT. WASHINGTON, PA. U.S.A.
09:43
TEMP 03/11/96
0 TO 700 DEG F
10:43
TEMP 03/11/96
0 TO 700 DEG F
11:43
TEMP 03/11/96
0 TO 700 DEG F
12:43
TEMP 03/11/96
0 TO 700 DEG F
13:43
TEMP 03/11/96
0 TO 700 DEG F
100
200
300
400
500
600
Test 17 C
300°F/hr ramp
2hr soak
600°F soak te



Test 17 C
300°F/hr ramp
2hr soak
600°F soak temp

Pre - START-UP (1 of 3)

Date: MAR 11 96
Time: 1500

Test Number: 18 HOT DECON
Ramp-Up Rate: 300°F / hr
Soak Time: 2 HR
Soak Temp: 600°F

MECHANICAL

Initial each item

- [x] **Inspection doors/manways are SECURED**
- [x] **Gas Valves OPEN**
- [x] **View/Inspection Ports CLOSED**
- [x] **Record Gas (Propane) Valve Position**

Verify all valves, doors, inspection ports, manway, etc have been returned to a position capable of sustaining system operations.

ELECTRICAL

Initial each item.

- [ ] **All Lockout/Tagouts (1-5) are ACCOUNTED.**
- [ ] **Furnace and Afterburner Control Breakers are ON.**
- [ ] **Verify Emergency Pushbuttons are NOT ENGAGED.**
- [ ] **BUMP Motors and switch to "AUTO"**

______ *Furnace Combustion Blower (M-220)*
______ *Afterburner Combustion Blower (M-130)*
______ *Afterburner I.D Fan (M-158)*
______ *Place Afterburner Switch in REMOTE*

Verify field selector switches are in "AUTO" after all motors have been "BUMPED" to verify operations

- [ ] **Calibrate CEM**

	Tank Values	Recorded Values	Adjustment (Y/N)
______ Interconnecting Duct - NOx			
______ Interconnecting Duct - THC			
______ Stack NOx			
______ Stack SO2			
______ Stack THC			
______ Stack CO			
______ Stack O2			
______ Stack CO			

** *Verify that all regulators for Calibration Gas Tanks are CLOSED*

- [ ] **Datalogger/Computer is ON**

______ *Record Time (Computer Clock)*
______ *Record Ambient Temperature (TT-300)*
______ *Record Ambient Humidity (call Weather Service 663-3010 or 945-7000)*

- [ ] **Pre - Spike Activities**

______ *Lock-out all Motors: Complete Exclusion Log*
______ *Secure Equipment Pad and Access Road w/ Chains*
______ *Spike Test Materials and Furnace Test Plates*

Test Number

OADING/UNLOADING (2 of 3)

Ramp-Up Rate:

Date:

Soak Time:

Time:

Soak Temp:

IELD ACTIVITIES

Initial each item.

☐ **Load Furnace with Materials and Thermocouples**

For each rack bin, provide a description in terms of contents, appearance, moisture, etc
**** Refer to loading procedures for instructions.**

#/ Rack A's Characteristics
600 LBS

Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)

***** Secure pipe to prevent pipes from rolling***

Take Pictures

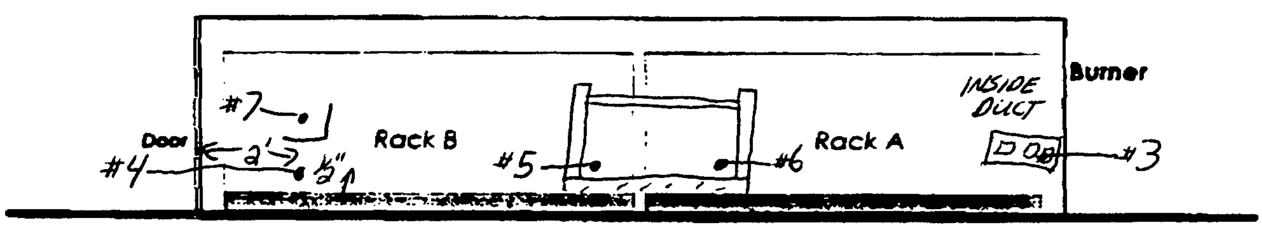
Rack B's Characteristics

Initial Wt. (lbs)	Final Wt. (lbs)	Materials	Initial Wt. (lbs)	Final Wt. (lbs)

Take Pictures

***** SP-Spiked Steel Pipe, SC-Spiked Clay Pipe, SD-Spiked Cinder Blocks***
CP-Contaminated Steel Piep, CC-Cont. Clay Pipe, CD-Cont. Debris
Total Weight of the two racks must be less than 3,000 Lbs.

☐ **Mark Locations of Thermocouples**



☐ **Roll Calls and Close Furnace Door**

Verify all site personnel are accounted for.
Have each person initial this checklist at left
Close and secure furnace door.

☐ **Complete Spike Sample Weigh Sheet**

**** SEE NEXT PAGE FOR AFTERBURNER and FURNACE START-UP SEQUENCE**

Date: ______________

Time: ______________

Rmp-Up Time: ______________

Soak Time: ______________

Soak Temp: ______________

BURNER START-UP

Initial and record time for each item.

] **Start "I.D. FAN". Adjust fan speed to maintain a system draft < -0.5 In. WC**

] **Start "Pre-Mix AIR BLOWER". Adjust fan speed to maintain <-0.5 In.WC**

] **Start "OXIDIZER" (Burner). Adjust fan speed to maintain <-0.5 In.WC**

Once the burner has started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire.

] **Start "DATALOGGER" Pushbuttons on the Computer.**

] **Warm-Up Burner up to 1800 Deg. F. Adjust fan speed to maintain <-0.5 In.WC**

@ 600 F: ________ :Time

@ 1200 F: ________ :Time

@ 1800F: ________ :Time

Once the burner is at low fire, burner control will be released to the operator.
The operator must adjust gas flow and ID fan speed to maintain temperature 1800°F and system draft @ <-0.5 In WC.

RNACE START-UP

Initial and record time for each item.

] **Set Bleed Air Damper to 75%**

] **Turn Furnace Key to "BLOWER" Position. Adjust ID fan speed to maintain <-0.5 In.WC**

] **Set Controller to "MANUAL". Set controller output to 0.0**

] **Turn Furnace Key to "BURNER" Position.**

] **Verify "INTERLOCK OK" Light is energized.**

Once the burner started, the control system will initiate a purge sequence.
The pilot will then attempt to light the burner at low fire

] **Open Bleed Air Valve to 100%**

] **Ramp-Up Furnace Temp to Soak Temp. Maintain Ramp-Up Rate, System Draft and Temp's.**
Record Furnace temperatures during ramp-up hourly, on the control room log sheet.

Once the burner is operating at low fire, burner control will be released to the operator. The operator must adjust ID fan speed to maintain <-0.5 In.WC, afterburner temp @ 1800 Deg F, and furnace temp @ SOAK temperature.

] **Manually Log Operating Parameters.**

Use the attached Log Sheet to record all operating parameters at least hourly.
SOAK TIMES and TEMPERATURES will vary from test to test.

***** USE NEXT PAGE(S) TO LOG OPERATING PARAMETERS***

OL-DOWN

Initial and record time for each item.

] **Turn Furnace Key to "BLOWER" After lowering Furnace Temp to 200 Deg. F.**

] **STOP "OXIDIZER" and "AIR BLOWER"**

] **STOP Computer Datalogger when all thermocouples indicate less than 150 Deg F.**

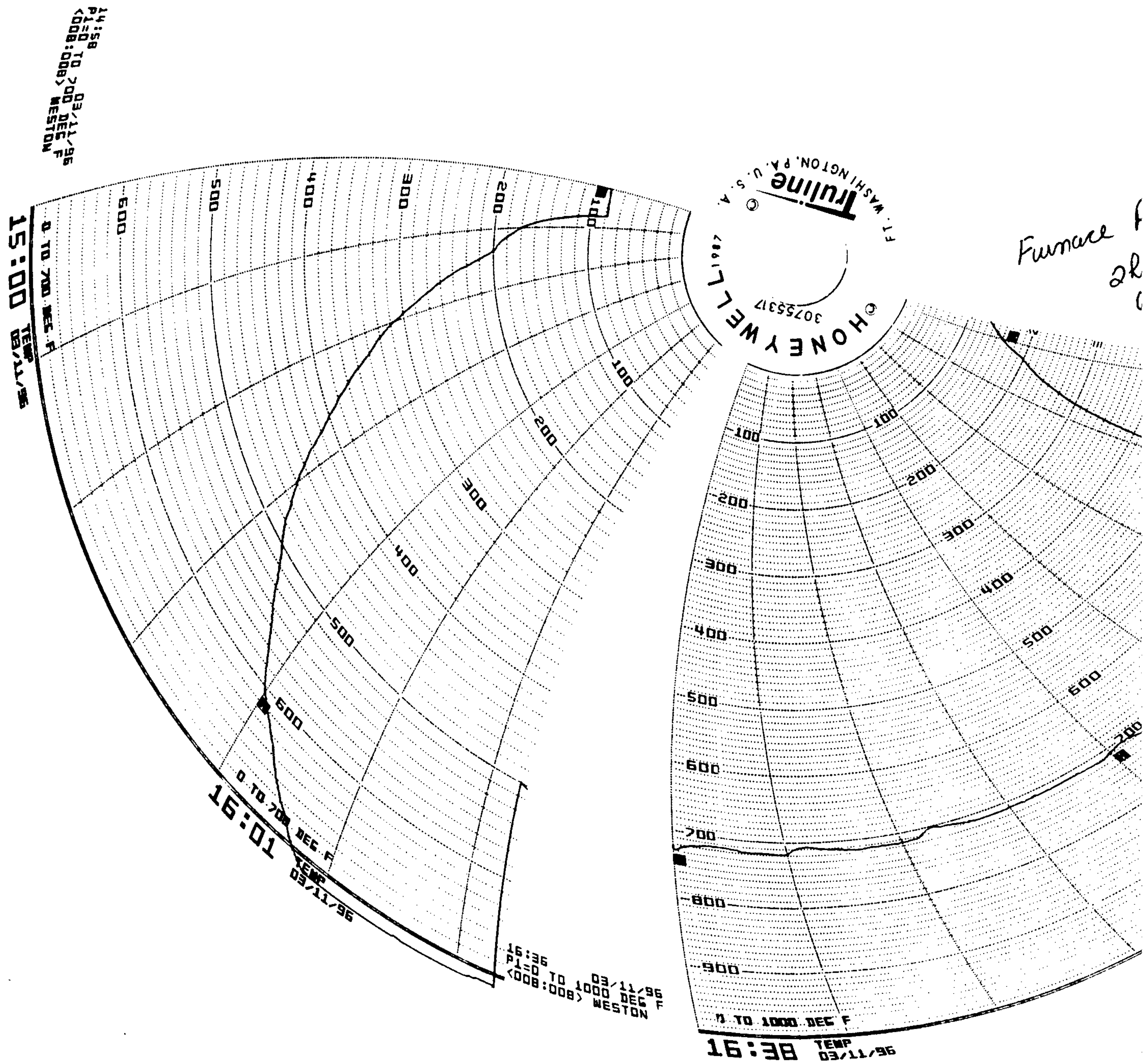
***** FOLLOW THE FURNACE UNLOADING PROCEDURES IN APPENDIX "X" OF HASP.***

HOURLY DATALOG (___ of ___)

Date: MAR 11 96
Time: 1500

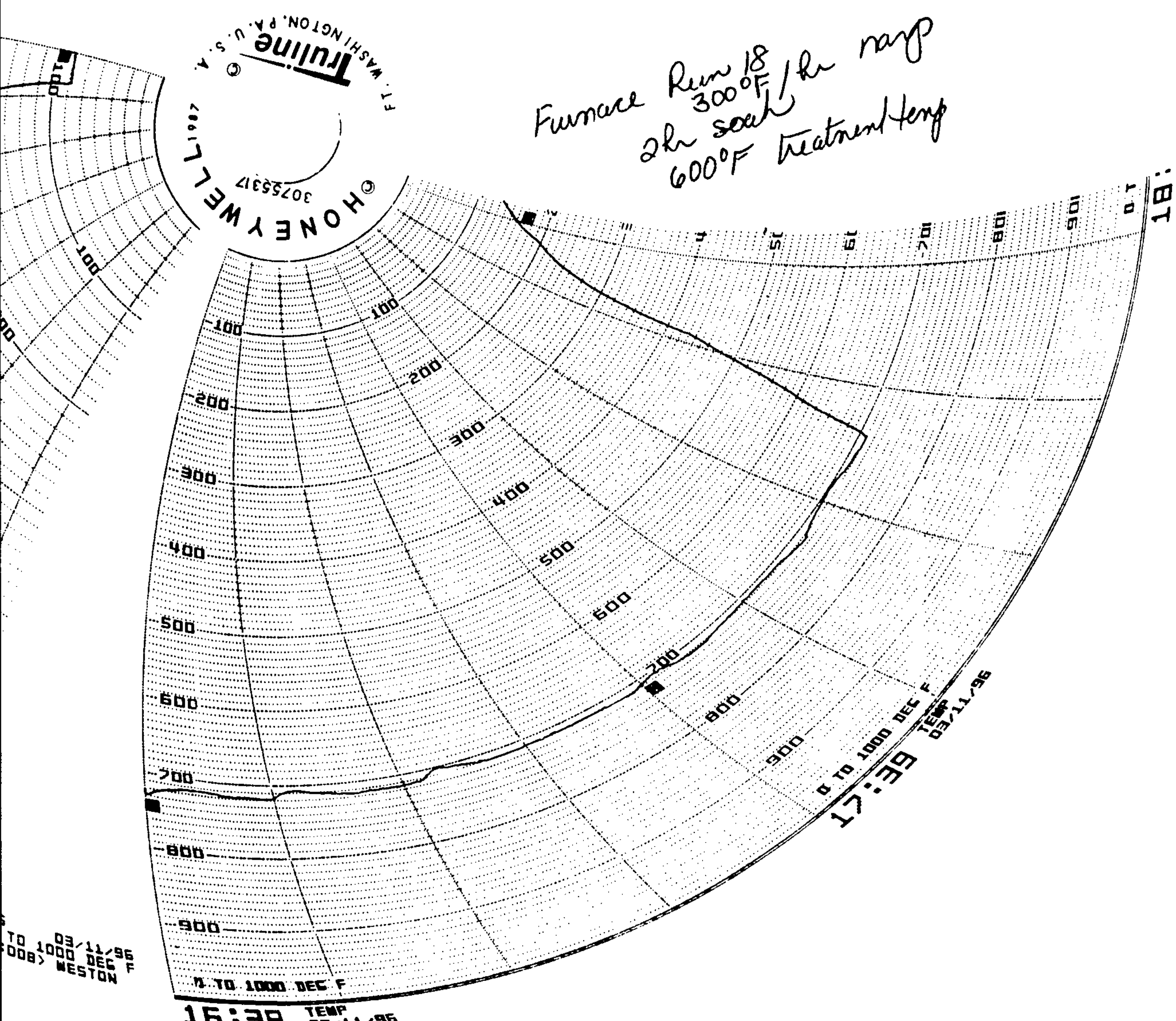
Test Number: 18 HOT DECON
Ramp-Up Rate: 300°F/hr
Soak Time: 2 HRS
Soak Temp: 600°F

Tag	Description	Unit	1500	1600	1630	1700	1730	1800
		Time:						
FURNACE								
PIT-232	Fuel Gas Pressure	in.WC	3.56	11.56	11.84	11.73	11.69	11.76
FIT-231	Fuel Gas Flow	CFH	0	175	170	154	144	142
PIT-222	Combustion Air Pressure	in.WC	23.06	24.52	24.58	24.58	24.61	24.86
FIT-221	Combustion Air Flow	CFH	11920	9875	9863	9875	9906	9925
PIT-158	Chamber Pressure	in.WC	-.26	-.16	-.12	-.12	-.11	-.10
TIT-201	Recorder Temperature	Deg.F	85	525	722	718	708	707
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	86	492	677	677	668	667
TIT-203	Material Thermocouple #1	Deg.F	85	489	671	670	664	662
TIT-204	Material Thermocouple #2	Deg.F	100	438	614	622	626	632
TIT-205	Material Thermocouple #3	Deg.F	88	471	661	666	661	661
TIT-206	Material Thermocouple #4	Deg.F	91	458	638	645	643	646
TIT-207	Material Thermocouple #5	Deg.F	78	568	749	732	715	710
	MATERIAL AVG. TEMP		88	486	666	666	661	662
AFTERBURNER								
TIT-131	Combustor Burner Temp. Control	Deg. F	1721	1824	1824	1806	1812	1809
FIT-149	Fumes Flow	CFM	2269	2338	2338	2304	2308	2335
PIT-151	Fumes Pressure (Furnace Draft)	inWC	.42	.35	.31	.36	.37	.38
TIT-145	Combustor Temperature	Deg. F	1736	1809	1799	1815	1818	1830
PIT-133	Fuel Pressure	PSIG	.81	.41	.29	.33	.33	.30
TIT-121	Fuel Gas Flow	CFM	1099	615	478	545	544	478
	TIT 160 EXIT TEMP		85	464	637	638	641	641
CEM								
NOx-B	Interconnecting Duct NOx	ppm	3.0	7.8	8.8	9.4	7.4	7.8
THC-B	Interconnecting Duct THC	ppm	1.4	16.9	11.1	12.1	12.5	14.9
CO	Stack's CO	ppm	3.5	3.5	3.5	3.5	3.5	5.0
THC	Stack's THC	ppm	0.0	0.0	0.1	0.0	0.0	0.0
~~NOx~~ NO	~~Stack's NOx~~ DUCT NO	ppm	-.5	2.8	6.3	5.0	4.9	4.2
SO2	Stack SO2	ppm	1.5	1.5	1.0	1.0	2.0	2.0
O2	Stack's O2	%	14.58	13.85	14.30	13.82	14.00	14.02
CO2	Stack's CO2	%	6.9	7.24	6.98	7.04	6.90	14.43
TIT-300	Ambient Temp	Deg. F						
Weather Service	Relative Humidity							


14:58 03/11/96
P1=0 TO 700 DEG F
<008:008> WESTON
15:00 TEMP 03/11/96
0 TO 700 DEG F
16:01 TEMP 03/11/96
16:36 03/11/96
P1=0 TO 1000 DEG F
<008:008> WESTON
0 TO 1000 DEG F
16:38 TEMP 03/11/96
HONEYWELL
Truline
FT. WASHINGTON, PA. U.S.A.
3075317

Furnace

Furnace Run 18
300°F/hr ramp
2hr soak
600°F treatment temp



2

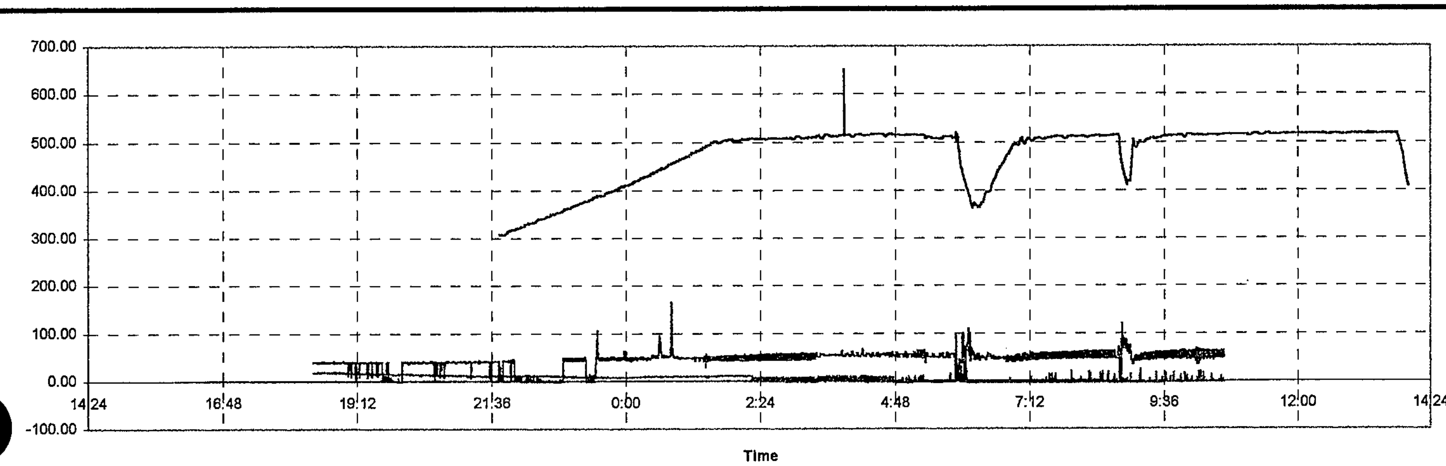
APPENDIX G

SUMMARY OF DATA SHEETS FOR TEST RUNS 1-15

SUMMARY OF DATA

Date:	6-Feb-96	Test Number:	1
Time:	12:28	Soak Time:	12 Hrs
		Soak Temp:	Greater than 500 F

Tag	Parameter Description	Unit	WARM 16:30 – 16:32				RAMP 16:32 – 1:32				SOAK 1:32 – 13:50				COOL 13:50 – 14:30			
			Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	-0.11	33.96	3.31	10.77	-0.10	45.13	28.44	10.43	-0.16	68.30	34.46	7.66	-0.23	16.90	1.00	4.12
FIT-231	Fuel Gas Flow	CFH	175.13	201.18	198.27	8.13	166.68	200.93	172.57	5.88	164.58	202.00	169.51	6.13	176.43	201.58	197.66	5.73
PIT-222	Combustion Air Pressure	In.WC	23.82	25.12	23.96	0.41	23.79	25.55	25.23	0.30	23.60	25.45	25.13	0.31	23.26	24.65	23.55	0.30
FIT-221	Combustion Air Flow	CFH	725	1898	847	370	733	2214	1971	257	639	2313	2051	265	602	1711	782	254
PIT-158	Chamber Pressure (Draft)	In.WC	-0.38	-0.10	-0.31	0.08	-0.51	-0.10	-0.32	0.03	-0.89	0.00	-0.48	0.06	-1.00	-0.09	-0.41	0.14
TIT-201	Recorder Temperature	Deg.F	36.30	36.68	36.47	0.11	45.30	551.03	323.88	130.86	304.20	570.45	536.58	43.26	183.30	512.85	293.80	89.40
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	36.45	36.75	36.59	0.12	44.78	554.78	326.58	131.69	302.70	575.48	539.38	44.00	183.30	514.65	293.01	89.69
TIT-203	Material Thermocouple #1	Deg.F	36.23	36.75	36.44	0.15	37.05	510.8	277.62	123.14	372.90	1200.0	511.35	28.82	248.63	507.68	386.05	80.95
TIT-204	Material Thermocouple #2	Deg.F	34.20	34.58	34.39	0.10	36.68	447.98	240.37	104.64	366.00	523.28	470.16	22.72	289.95	488.40	370.62	57.96
TIT-205	Material Thermocouple #3	Deg.F	35.40	35.70	35.54	0.10	40.20	485.78	267.34	115.90	355.88	528.83	502.46	29.19	242.33	493.80	343.92	69.69
TIT-206	Material Thermocouple #4	Deg.F	36.08	36.45	36.20	0.12	40.20	524.40	301.07	129.08	360.68	532.58	518.41	32.49	235.20	520.28	363.77	86.51
TIT-207	Material Thermocouple #5	Deg.F	35.85	36.23	36.02	0.11	43.73	533.48	300.92	127.23	293.70	560.03	520.21	42.73	181.65	495.00	283.93	83.25
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1794	1810	1805	5	1145	1850	1809	46	1358	1850	1797	41	1181	1815	1755	99
FIT-149	Fumes Flow	PPH	2203	2403	2258	73	15	3376	594	585	48	614	408	55	38	525	381	73
PIT-151	Fumes Pressure	InWC	0.50	0.71	0.56	0.07	0.37	0.89	0.63	0.08	-0.06	0.91	0.37	0.07	0.34	2.30	1.05	0.39
TIT-145	Combustor Temperature	Deg. F	1796	1812	1807	5	1111	1850	1813	49	1341	1850	1804	43	1156	1824	1758	105
PIT-133	Fuel Pressure	PSIG	0.77	0.81	0.78	0.01	0.01	0.85	0.56	0.19	0.01	0.86	0.13	0.07	0.00	0.85	0.56	0.31
FIT-121	Fuel Gas Flow	CFH	1041	1077	1047	11	1	1103	863	144	1	1097	542	90	1	1098	841	303
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	0.50	0.53	0.50	0.01	0.48	0.95	0.78	0.11	0.48	1.08	0.90	0.11	0.50	0.68	0.57	0.05
THC-B	Interconnecting Duct THC	ppm	-1.47	-1.30	-1.37	0.05	-1.54	100.00	14.69	7.63	-3.66	37.52	0.45	4.83	-2.62	46.33	0.49	7.39
CO	Stack's CO	ppm	-1.00	-0.50	-0.55	0.16	-1.00	173.00	0.07	8.07	-1.00	319.00	0.27	11.44	-0.50	25.50	0.02	3.06
THC	Stack's THC	ppm	0.26	0.48	0.37	0.07	0.26	58.73	0.88	2.47	-0.10	25.70	0.93	1.20	0.63	30.79	1.67	3.42
NOx	Stack's NOx	ppm	38.90	44.53	42.89	1.55	-0.18	166.03	36.57	17.35	1.75	121.18	53.83	8.63	0.28	104.73	48.18	18.61
SO2	Stack SO2	ppm	-1.00	1.50	0.10	0.77	-5.00	-0.50	-1.89	0.49	-5.50	-0.50	-2.36	1.04	-5.50	-4.50	-5.05	0.30
O2	Stack's O2	%	12.70	12.98	12.79	0.08	10.13	21.20	12.14	0.72	6.95	21.13	12.12	1.01	11.18	21.23	14.22	1.63
CO2	Stack's CO2	%	5.20	5.38	5.34	0.05	0.12	6.90	5.70	0.44	0.16	8.94	5.69	0.63	0.10	6.26	4.39	1.01
TIT-300	Ambient Temp	Deg. F																



CEM DATA FOR VALIDATION TEST#1, #2, and #3

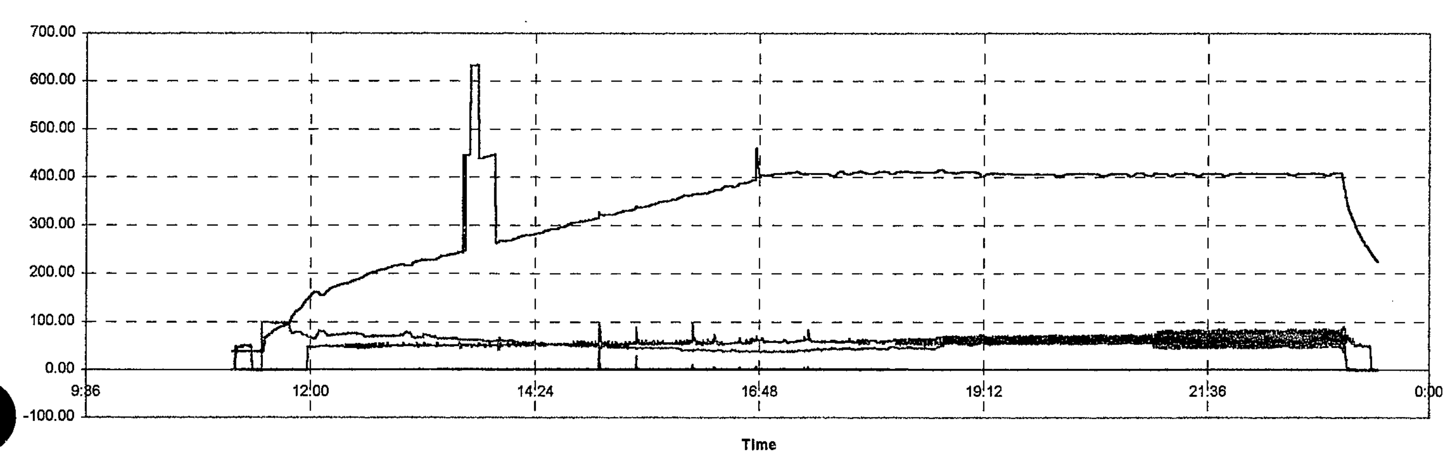
Stack Testing - Test #1	Duct_NOX	Duct_THC	Stack_CO	Stack_THC	Stack_NOX	Stack_SO2	Stack_O2	Stack_CO2
1/31/96 18:31 Start-Time								
Min	0.65	7.25	-1.00	0.31	0.03	-5.00	11.23	5.38
Max	0.95	20.19	-0.50	1.24	166.03	-0.50	12.63	6.62
Average	0.82	12.25	-0.51	0.73	35.39	-1.77	12.05	5.74
Stdev	0.07	3.11	0.07	0.15	19.11	0.48	0.28	0.17
2/1/96 1:22 End Time								
Stack Testing - Test #2	**Duct_NOX**	**Duct_THC**	**Stack_CO**	**Stack_THC**	**Stack_NOX**	**Stack_SO2**	**Stack_O2**	**Stack_CO2**
2/2/96 14:04 Start-Time								
Min	1.03	37.15	-1.00	-0.23	49.13	0.00	10.90	5.36
Max	42.53	64.23	0.00	2.34	98.80	5.00	12.73	6.48
Average	1.95	49.23	-0.47	0.92	59.62	2.35	11.87	5.82
Stdev	1.57	7.17	0.15	0.67	6.03	1.41	0.39	0.25
2/2/96 20:43 End Time								
Stack Testing	**Duct_NOX**	**Duct_THC**	**Stack_CO**	**Stack_THC**	**Stack_NOX**	**Stack_SO2**	**Stack_O2**	**Stack_CO2**
2/4/96 14:08 Start-Time								
Min	2.45	4.54	-0.50	-5.07	41 70	1.00	9.73	5.00
Max	117.65	100.00	0.50	6.49	177.13	2.50	13.55	7.48
Average	4.22	77.73	0.15	1.22	63.32	1.48	11.86	6.11
Stdev	4.85	22.25	0.23	5.05	8.10	0.36	0.51	0.33
2/4/96 20:49 End Time								

SUMMARY OF DATA

Date: 7-Feb-96
Time: 9:00

Test Number: 2
Soak Time: 6 Hrs
Soak Temp: Greater than 400 F

Tag	Parameter Description	Unit	11:09 WARM 11:29				11:29 RAMP 16:45				16:45 SOAK 23:03				23:03 COOL 23:04			
			Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	-0.16	37.59	1.20	6.84	-0.12	45.64	25.39	5.82	16.43	37.03	28.56	2.83	-0.10	13.81	13.45	3.65
FIT-231	Fuel Gas Flow	CFH	10.50	11.53	10.67	0.16	-0.25	34.03	27.89	6.94	-2.40	12.30	4.51	4.63	-2.38	6.43	6.04	2.26
PIT-222	Combustion Air Pressure	In.WC	23.44	23.56	23.50	0.03	23.44	25.43	25.06	0.25	25.24	25.66	25.48	0.08	24.10	25.29	25.25	0.28
FIT-221	Combustion Air Flow	CFH	12438	12542	12499	17	10475	12458	10751	208	10464	11327	10776	118	11388	12763	11403	329
PIT-158	Chamber Pressure (Draft)	In.WC	-0.75	-0.60	-0.67	0.04	-0.80	0.48	-0.24	0.25	-0.77	-0.20	-0.61	0.18	-1.00	-0.19	-0.33	0.10
TIT-201	Recorder Temperature	Deg.F	39.30	39.98	39.63	0.13	43.80	435.53	300.19	85.79	419.10	450.53	431.33	6.56	176.85	418.73	415.16	64.85
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	39.60	40.13	39.87	0.13	44.03	438.83	302.41	86.33	421.58	453.68	434.11	6.76	176.40	420.53	416.93	65.07
TIT-203	Material Thermocouple #1	Deg.F	38.25	38.93	38.55	0.17	41.10	397.65	268.98	84.60	396.68	416.25	407.43	3.27	239.55	398.40	395.89	45.96
TIT-204	Material Thermocouple #2	Deg.F	38.85	39.30	39.02	0.10	42.23	392.33	266.17	79.41	392.40	411.08	401.76	2.63	185.40	393.75	389.70	54.38
TIT-205	Material Thermocouple #3	Deg.F	40.05	40.73	40.31	0.13	40.88	1200.00	259.50	181.84	365.55	408.15	400.91	8.49	330.75	406.58	406.05	20.66
TIT-206	Material Thermocouple #4	Deg.F	38.10	38.63	38.31	0.11	40.05	404.70	274.36	85.44	405.38	421.95	412.90	3.48	206.93	404.25	401.40	53.87
TIT-207	Material Thermocouple #5	Deg.F	38.70	39.30	39.02	0.14	42.08	1200.00	333.55	219.14	404.85	745.80	418.39	17.49	167.93	401.70	397.01	59.22
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	355	1771	1537	296	1776	1837	1810	8	1784	1835	1810	11	1016	1824	1810	225
FIT-149	Fumes Flow	PPH	51	944	395	201	2	1506	473	199	-13	1150	452	161	6	665	529	111
PIT-151	Fumes Pressure	InWC	0.40	0.51	0.47	0.02	0.31	0.74	0.45	0.05	0.21	0.65	0.33	0.08	0.42	2.39	0.51	0.24
TIT-145	Combustor Temperature	Deg. F	401	1782	1560	280	1787	1846	1817	8	1789	1846	1818	13	982	1832	1817	238
PIT-133	Fuel Pressure	PSIG	0.83	0.84	0.84	0.00	0.17	0.84	0.44	0.14	0.06	0.23	0.13	0.04	0.00	0.81	0.08	0.30
IT-121	Fuel Gas Flow	CFH	1101	1106	1103	1	625	1104	781	104	394	685	563	80	1	1048	448	382
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	0.93	1.03	0.98	0.03	1.03	42.53	1.98	1.69	0.95	7.50	1.44	0.54	0.05	0.78	0.73	0.14
THC-B	Interconnecting Duct THC	ppm	-1.21	100.00	4.26	21.96	37.74	100.00	59.94	15.26	37.15	70.60	53.47	7.57	0.39	89.99	82.06	24.26
CO	Stack's CO	ppm	-0.50	96.50	2.54	14.02	-0.50	0.00	-0.50	0.01	-1.00	0.00	-0.46	0.18	-0.50	31.00	-0.50	4.90
THC	Stack's THC	ppm	2.64	6.23	3.09	0.54	1.05	2.77	1.99	0.41	-0.23	1.32	0.43	0.29	0.70	26.94	0.73	4.68
NOx	Stack's NOx	ppm	0.00	52.38	26.08	24.75	0.00	98.80	49.18	16.02	43.73	86.23	63.11	9.41	0.83	72.73	59.59	22.20
SO2	Stack SO2	ppm	3.50	4.50	3.98	0.12	2.50	5.00	4.19	0.58	0.00	3.00	1.75	0.80	2.50	3.50	2.75	0.21
O2	Stack's O2	%	11.68	14.03	12.20	0.29	10.68	12.90	11.79	0.27	10.50	13.80	11.96	0.73	11.20	21.13	11.98	2.94
CO2	Stack's CO2	%	4.54	5.84	5.50	0.17	4.98	7.06	5.74	0.18	4.64	6.76	5.86	0.46	0.12	6.28	5.74	1.86
TIT-300	Ambient Temp	Deg. F	37.76	38.30	37.91	0.12	32.00	38.66	35.15	1.74	32.00	33.26	32.03	0.12	32.00	32.00	32.00	0.00

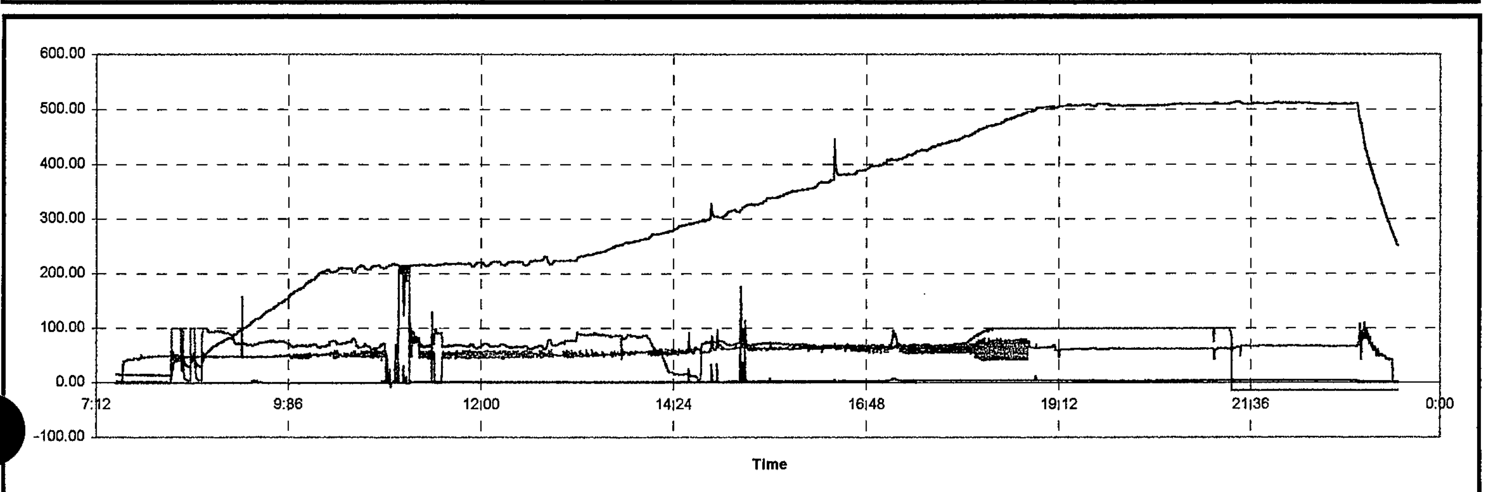


SUMMARY OF DATA

Test Number: 3
Soak Time: 4 Hrs.
Soak Temp: Greater than 500 F

Date: 4-Feb-96
Time: 7:28

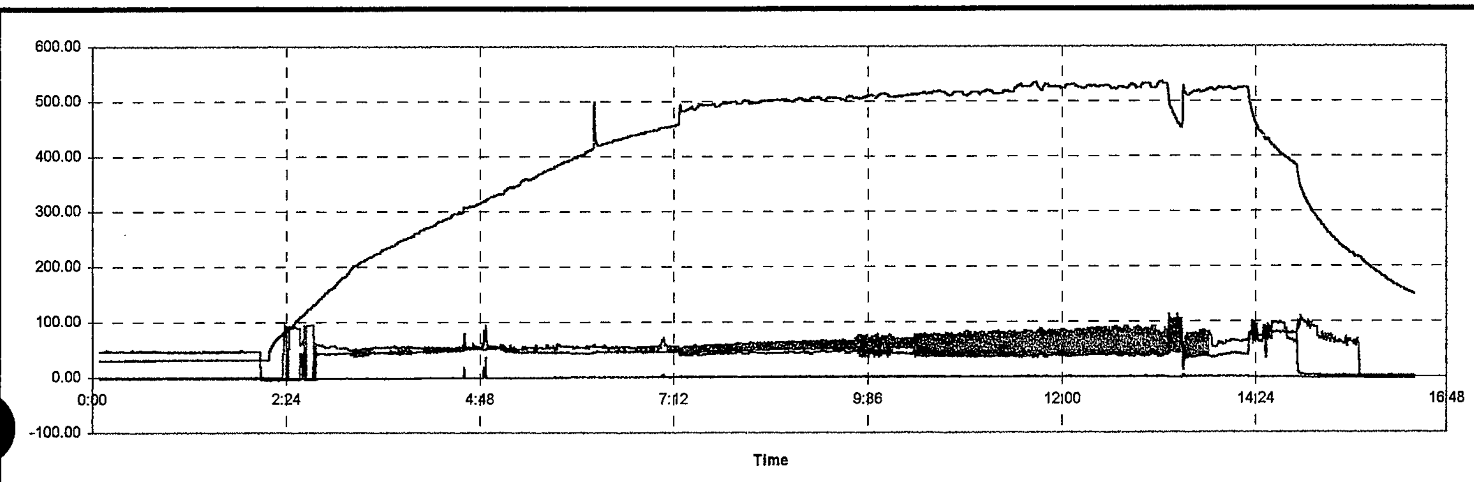
			7:31	WARM		8:08	8:08	RAMP		18:55	18:55	SOAK		22:56	22:56	COOL		23:22
Tag	Parameter Description	Unit	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	0.07	35.02	0.34	2.86	0.08	42.41	24.12	7.89	28.74	38.62	32.92	1.66	-0.05	26.90	2.24	6.32
FIT-231	Fuel Gas Flow	CFH	35.65	60.08	46.55	7.50	15.05	57.78	30.12	4.55	32.23	34.40	33.16	0.35	10.85	31.38	13.53	5.61
PIT-222	Combustion Air Pressure	In.WC	25.45	25.91	25.62	0.11	25.40	27.25	26.85	0.28	27.07	27.41	27.21	0.07	25.98	27.26	26.22	0.35
FIT-221	Combustion Air Flow	CFH	12964	13120	13047	29	10259	13064	10671	453	10261	10541	10407	47	10602	12269	12037	447
PIT-158	Chamber Pressure (Draft)	In.WC	-0.53	-0.33	-0.50	0.03	-0.99	-0.19	-0.45	0.09	-0.65	-0.32	-0.57	0.06	-0.65	-0.17	-0.35	0.13
TIT-201	Recorder Temperature	Deg.F	14.25	15.23	14.65	0.16	19.50	542.03	310.88	120.71	531.98	548.33	537.82	3.96	201.08	531.45	320.88	94.74
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	14.55	15.30	14.93	0.15	19.50	547.65	313.47	122.25	536.03	553.65	542.39	4.35	197.55	535.80	318.07	96.88
TIT-203	Material Thermocouple #1	Deg.F	13.50	14.63	14.00	0.25	16.20	756.08	291.21	126.53	531.60	544.20	536.67	3.16	305.10	531.90	408.79	60.07
TIT-204	Material Thermocouple #2	Deg.F	15.00	15.90	15.36	0.19	16.73	492.75	274.33	113.57	493.35	510.98	506.14	2.84	284.10	506.03	377.00	64.27
TIT-205	Material Thermocouple #3	Deg.F	17.55	18.45	17.97	0.25	17.85	420.60	223.62	99.59	421.13	475.73	457.42	15.14	400.80	475.88	442.20	23.18
TIT-206	Material Thermocouple #4	Deg.F	13.28	14.55	13.77	0.24	17.55	500.85	272.72	115.16	501.45	511.50	507.78	2.16	220.80	507.53	354.61	88.50
TIT-207	Material Thermocouple #5	Deg.F	13.88	14.55	14.17	0.14	19.43	552.08	308.32	125.56	536.48	555.38	543.54	4.62	191.25	535.43	318.46	95.42
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	13	1759	1539	369	1749	1850	1810	12	1756	1850	1800	19	1769	1833	1807	15
FIT-149	Fumes Flow	PPH	0	956	345	220	-18	1222	425	213	19	839	386	88	261	395	356	20
PIT-151	Fumes Pressure	InWC	0.43	0.60	0.46	0.02	0.26	0.77	0.41	0.06	0.20	0.51	0.23	0.02	0.21	1.48	0.83	0.41
TIT-145	Combustor Temperature	Deg. F	14	1765	1552	364	1753	1850	1815	13	1760	1850	1807	19	1771	1842	1812	17
PIT-138	Fuel Pressure	PSIG	0.02	0.88	0.86	0.11	0.05	0.89	0.37	0.22	0.05	0.09	0.08	0.00	0.05	0.90	0.51	0.32
T-121	Fuel Gas Flow	CFH	1	1089	1074	108	352	1090	729	154	368	502	460	11	350	1080	804	221
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.05	0.03	-0.02	0.01	-0.15	215.25	5.23	22.69	3.48	12.33	4.20	0.32	1.75	4.35	2.02	0.51
THC-B	Interconnecting Duct THC	ppm	1.25	2.37	1.78	0.17	-8.41	100.00	69.93	20.48	-14.31	100.00	55.21	55.73	-14.26	-14.18	-14.23	0.02
CO	Stack's CO	ppm	-0.50	96.50	2.45	11.06	-1.00	487.50	4.02	40.52	-0.50	0.50	0.35	0.23	0.00	0.50	0.34	0.23
THC	Stack's THC	ppm	1.18	56.39	2.47	5.63	-5.07	97.53	3.27	8.63	-4.69	-4.21	-4.50	0.07	-4.66	-4.35	-4.51	0.07
NOx	Stack's NOx	ppm	0.33	51.40	45.46	7.73	-0.20	207.93	58.25	20.80	43.65	71.50	64.71	2.82	42.25	110.23	65.45	19.14
SO2	Stack SO2	ppm	5.00	6.50	6.11	0.25	-1.50	453.50	8.43	46.16	-1.00	2.00	0.84	0.69	-0.50	0.50	-0.11	0.27
O2	Stack's O2	%	12.63	21.63	13.12	1.38	0.08	22.70	11.91	2.11	11.10	13.75	11.84	0.20	11.75	15.23	13.53	0.65
CO2	Stack's CO2	%	0.04	7.40	5.44	0.88	0.06	17.68	5.95	1.44	4.82	6.60	6.18	0.13	4.00	6.28	5.06	0.45
TIT-300	Ambient Temp	Deg. F	32.00	32.00	32.00	0.00	32.00	37.04	32.02	0.25	32.00	32.00	32.00	0.00	32.00	32.00	32.00	0.00



SUMMARY OF DATA

Test Number:	4
Date: 6-Feb-96	Soak Time: 6 Hrs
Time: 2:17	Soak Temp: Greater than 500 F

			21:01	WARM		2:11	2:11	RAMP		8:03	8:03	SOAK		14:19	14:19	COOL		16:22
Tag	**Parameter Description**	**Unit**	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.57	3.84	3.70	0.02	6.81	12.22	10.71	0.89	7.97	12.03	10.66	0.56	3.32	8.15	4.77	2.10
FIT-231	Fuel Gas Flow	CFH	-0.63	109.70	-0.16	3.12	35.58	181.10	89.15	24.03	38.45	282.60	99.23	13.98	-1.18	39.15	10.27	17.91
PIT-222	Combustion Air Pressure	In.WC	24.68	25.25	24.95	0.08	25.43	26.07	25.88	0.10	24.13	25.80	25.02	0.43	23.27	24.20	23.59	0.36
FIT-221	Combustion Air Flow	CFH	11902	12091	11966	24	9850	11103	10207	238	9561	10491	9940	104	10398	11636	11252	517
PIT-158	Chamber Pressure (Draft)	In.WC	-0.45	-0.28	-0.29	0.02	-0.47	-0.20	-0.25	0.04	-0.35	-0.15	-0.25	0.04	-0.37	-0.08	-0.21	0.07
TIT-201	Recorder Temperature	Deg.F	29.70	33.75	31.24	0.90	37.20	558.15	369.87	132.35	427.95	557.48	543.86	16.08	120.68	505.35	255.28	110.74
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	29.70	33.68	31.27	0.86	37.20	565.13	373.52	133.64	428.48	561.30	547.58	16.69	120.30	506.85	254.66	111.37
TIT-203	Material Thermocouple #1	Deg.F	31.73	36.68	33.13	0.99	37.95	558.53	369.10	134.23	449.63	558.90	543.54	13.36	108.23	506.03	260.32	120.80
TIT-204	Material Thermocouple #2	Deg.F	32.78	38.25	34.28	1.50	33.60	375.23	220.68	98.70	375.38	486.00	449.66	31.95	245.03	483.00	370.32	75.40
TIT-205	Material Thermocouple #3	Deg.F	30.75	36.68	32.32	1.18	32.63	496.65	320.34	127.19	458.78	516.53	505.63	8.20	143.55	500.78	284.56	106.44
TIT-206	Material Thermocouple #4	Deg.F	28.95	34.43	30.57	0.97	36.68	829.28	321.76	125.49	422.40	539.55	505.25	17.63	123.53	487.80	235.91	95.57
TIT-207	Material Thermocouple #5	Deg.F	31.50	35.25	32.86	0.89	38.10	624.98	399.22	140.12	456.38	659.93	576.99	17.90	131.25	518.63	272.54	115.09
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	41	1811	1769	141	1792	1828	1809	6	1767	1850	1807	16	292	1850	1403	602
FIT-149	Fumes Flow	PPH	2075	2626	2161	85	2115	2428	2247	63	1977	2288	2175	61	1715	2599	2272	203
PIT-151	Fumes Pressure	InWC	0.44	0.71	0.47	0.04	0.26	0.67	0.47	0.06	0.16	0.51	0.31	0.05	0.07	0.69	0.43	0.16
TIT-145	Combustor Temperature	Deg. F	42	1818	1773	138	1797	1836	1814	7	1772	1850	1814	17	269	1850	1396	618
PIT-133	Fuel Pressure	PSIG	0.06	0.86	0.75	0.05	0.09	0.85	0.34	0.20	0.04	0.24	0.12	0.06	0.01	0.59	0.16	0.17
FIT-121	Fuel Gas Flow	CFH	367	1101	998	48	485	1093	716	135	347	684	525	110	1	879	426	318
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-1.30	1.38	-0.97	0.33	-1.33	36.93	0.32	1.72	-0.18	4.08	1.63	0.37	-0.73	0.15	-0.54	0.20
THC-B	Interconnecting Duct THC	ppm	-14.65	0.02	-1.02	3.74	-0.51	98.13	49.47	14.10	14.33	79.89	43.38	6.65	1.75	94.94	24.85	34.81
CO	Stack's CO	ppm	-0.50	446.50	5.93	48.90	-0.50	449.50	28.36	106.07	-0.50	1.50	-0.30	0.28	-0.50	35.00	0.30	2.62
THC	Stack's THC	ppm	-8.15	50.59	-2.95	3.26	-100.0	100.00	-4.86	24.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx	Stack's NOx	ppm	-4.10	52.78	34.43	21.37	-5.03	95.38	47.37	16.91	33.58	114.20	62.13	15.15	-2.03	110.48	51.44	39.67
SO2	Stack SO2	ppm	-3.50	-1.50	-2.51	0.29	-20.50	0.00	-1.33	1.04	-0.50	1.00	0.08	0.29	-1.00	0.00	-0.59	0.26
O2	Stack's O2	%	11.88	20.80	17.80	2.71	11.85	16.10	13.49	1.38	11.73	11.88	11.79	0.03	11.80	14.83	12.57	0.84
CO2	Stack's CO2	%	0.06	17.90	4.45	2.77	0.08	20.30	6.74	3.00	3.90	8.54	5.95	0.76	0.04	6.58	3.50	2.44
TIT-300	Ambient Temp	Deg. F	32.00	34.88	32.02	0.22	32.00	34.34	32.12	0.39	33.98	54.68	44.29	5.97	49.28	52.88	51.40	0.81

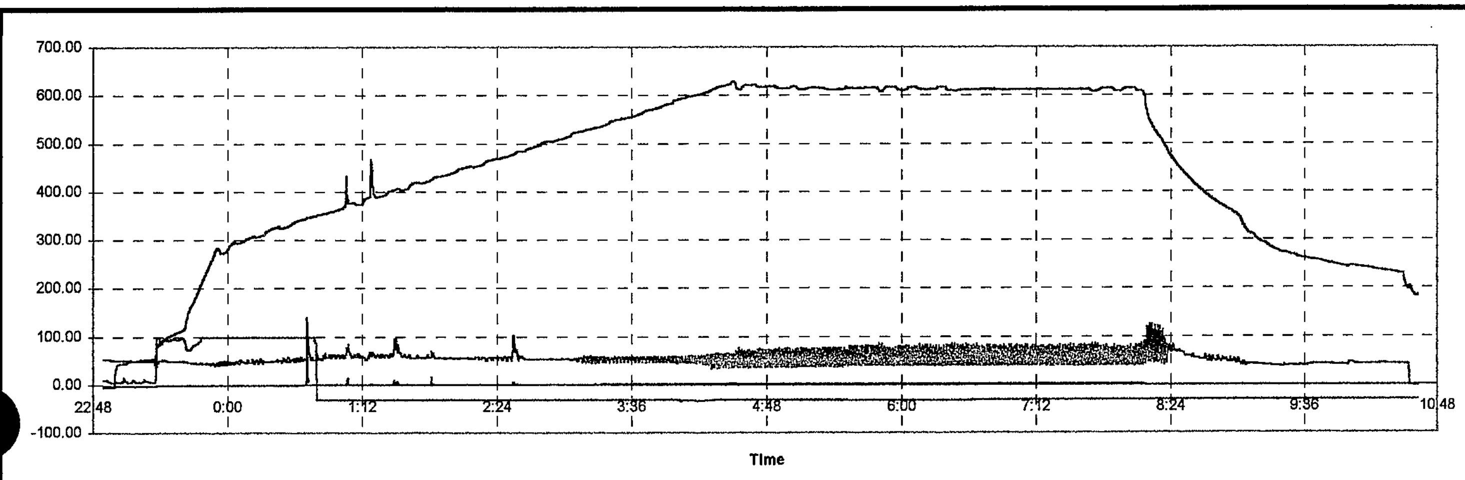


SUMMARY OF DATA

Date: 7-Feb-96
Time: 22:45

Test Number: 5
Soak Time: 4 Hrs.
Soak Temp: Greater than 600 F

			22:53	WARM		23:21	23:21	RAMP		4:08	4:08	SOAK		8:10	8:10	COOL		10:37
Tag	*Parameter Description*	*Unit*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	0.52	10.56	3.53	0.83	7.06	12.23	11.42	0.86	8.62	12.32	11.69	0.30	3.45	8.73	8.06	1.11
FIT-231	Fuel Gas Flow	CFH	-0.65	136.30	1.33	14.63	27.13	141.10	103.64	23.94	40.15	147.00	116.75	10.35	-1.68	42.23	35.23	9.72
PIT-222	Combustion Air Pressure	In.WC	0.11	25.34	23.69	3.91	24.59	25.54	25.29	0.16	24.39	25.56	25.27	0.19	22.62	24.40	23.87	0.38
FIT-221	Combustion Air Flow	CFH	122	11920	11512	1897	10159	11228	10351	203	10148	10922	10259	48	10814	12006	10938	250
PIT-158	Chamber Pressure (Draft)	In.WC	-0.44	0.02	-0.32	0.10	-0.50	-0.21	-0.26	0.03	-0.53	-0.20	-0.36	0.11	-0.57	-0.01	-0.41	0.09
TIT-201	Recorder Temperature	Deg.F	47.25	56.78	49.61	2.72	54.38	618.45	426.16	128.44	599.33	647.25	622.67	6.17	161.78	599.33	307.29	92.64
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	47.03	57.00	49.53	2.82	53.93	622.80	429.57	129.25	602.03	652.05	626.22	6.45	160.58	602.03	307.40	92.79
TIT-203	Material Thermocouple #1	Deg.F	50.18	61.73	51.62	1.33	61.73	802.73	450.27	133.19	615.45	677.93	649.59	7.76	160.80	615.45	295.39	110.84
TIT-204	Material Thermocouple #2	Deg.F	49.73	56.10	51.61	1.77	53.33	524.55	354.86	109.02	524.55	566.78	555.89	8.47	165.98	551.85	307.10	84.49
TIT-205	Material Thermocouple #3	Deg.F	48.98	57.00	51.06	2.12	53.55	566.93	378.84	124.24	566.93	593.93	586.69	3.96	187.20	576.53	324.37	94.78
TIT-206	Material Thermocouple #4	Deg.F	48.08	52.20	49.65	1.12	51.00	595.13	397.11	133.16	595.13	626.70	615.53	4.47	208.88	604.88	338.56	94.28
TIT-207	Material Thermocouple #5	Deg.F	51.00	62.78	52.62	1.61	62.78	725.70	467.02	135.84	621.75	699.30	662.13	10.23	179.78	621.75	328.44	96.64
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	63	1788	1224	689	1750	1828	1809	8	1783	1842	1814	17	928	1839	1782	116
FIT-149	Fumes Flow	PPH	526	2542	2177	472	2191	2542	2288	45	2028	2329	2137	73	1106	3375	2878	373
PIT-151	Fumes Pressure	InWC	0.04	0.69	0.48	0.14	0.39	0.67	0.44	0.03	0.18	0.43	0.32	0.05	-0.06	1.45	0.96	0.33
TIT-145	Combustor Temperature	Deg. F	63	1798	1240	694	1757	1838	1815	9	1786	1850	1821	19	889	1850	1784	123
PIT-133	Fuel Pressure	PSIG	0.01	0.85	0.66	0.34	0.07	0.85	0.26	0.20	0.04	0.24	0.10	0.06	0.00	0.88	0.60	0.28
FIT-121	Fuel Gas Flow	CFH	1	1105	874	441	455	1102	668	138	332	676	485	129	1	1099	899	272
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-1.23	-1.03	-1.14	0.06	-1.03	87.45	1.15	3.16	1.18	3.13	2.28	0.27	-0.68	1.18	-0.40	0.21
THC-B	Interconnecting Duct THC	ppm	4.89	22.59	7.47	2.62	-34.25	100.00	7.38	58.69	-34.20	-30.26	-31.19	0.75	-31.58	-30.26	-30.46	0.18
CO	Stack's CO	ppm	-0.50	105.00	2.08	12.64	-0.50	0.00	-0.12	0.22	-0.50	0.50	-0.08	0.19	-0.50	116.50	0.65	7.19
THC	Stack's THC	ppm	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOx	Stack's NOx	ppm	-4.13	55.18	37.33	22.63	41.05	138.30	55.08	7.55	34.23	89.63	58.21	15.86	-1.85	125.78	48.14	17.61
SO2	Stack SO2	ppm	2.00	4.00	2.62	0.41	2.50	6.00	4.75	0.59	3.00	4.50	3.85	0.45	2.50	3.50	2.70	0.26
O2	Stack's O2	%	11.70	21.13	14.08	3.74	10.25	12.70	11.36	0.34	9.25	13.38	11.38	1.37	10.83	20.80	13.04	1.52
CO2	Stack's CO2	%	0.02	6.02	4.55	2.42	5.32	6.66	6.07	0.22	4.62	7.42	5.97	0.91	-0.02	6.42	4.94	0.98
TIT-300	Ambient Temp	Deg. F	36.68	38.30	37.72	0.36	33.26	37.94	35.12	0.95	32.90	42.44	35.62	2.49	41.72	57.02	49.37	4.71

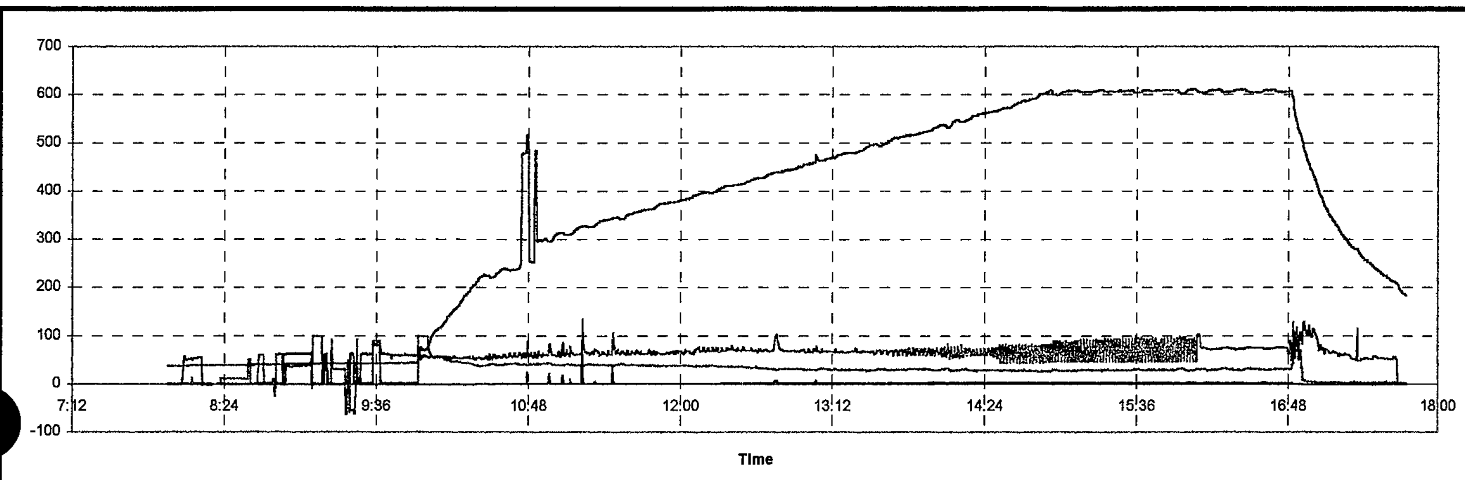


SUMMARY OF DATA

Date: 12-Feb-96
Time: 8:03

Test Number: 6
Soak Time: 2 Hrs.
Soak Temp: Greater than 600 F

			8:03	WARM		9:55	9:55	RAMP		14:49	14:49	SOAK		16:49	16:49	COOL		17:44
Tag	Parameter Description	Unit	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.66	10.66	3.82	0.34	3.77	11.63	11.07	0.62	10.05	11.63	11.36	0.11	3.23	10.07	4.07	1.43
FIT-231	Fuel Gas Flow	CFH	-1.70	104.50	-1.12	5.01	-1.60	141.38	103.66	22.38	66.15	139.93	119.55	6.95	-0.85	66.15	2.72	12.11
PIT-222	Combustion Air Pressure	In.WC	23.35	24.69	23.70	0.22	23.47	24.87	24.63	0.11	24.57	24.82	24.72	0.04	23.27	24.57	23.44	0.27
FIT-221	Combustion Air Flow	CFH	10403	12408	12220	110	10047	12116	10221	179	10088	10528	10172	34	10527	12280	12059	365
PIT-158	Chamber Pressure (Draft)	In.WC	-0.73	-0.17	-0.37	0.03	-0.73	-0.16	-0.34	0.12	-0.57	-0.47	-0.50	0.01	-0.89	-0.12	-0.42	0.18
TIT-201	Recorder Temperature	Deg.F	39.08	63.15	42.62	2.13	63.15	631.50	436.25	124.69	618.75	640.05	630.63	3.27	157.58	618.75	305.27	107.36
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	39.15	62.93	42.83	2.12	62.93	636.00	439.48	125.35	622.50	644.55	634.52	3.39	157.95	622.50	303.18	107.52
TIT-203	Material Thermocouple #1	Deg.F	39.53	50.78	42.76	1.76	50.78	604.80	385.40	123.87	604.43	633.15	621.57	6.77	197.63	620.25	354.13	108.24
TIT-204	Material Thermocouple #2	Deg.F	38.40	56.48	42.18	2.06	56.48	610.35	404.89	128.98	604.13	621.38	614.71	3.70	177.60	604.13	301.45	100.06
TIT-205	Material Thermocouple #3	Deg.F	36.68	43.88	40.26	1.91	43.58	1200.00	374.53	195.85	581.25	605.63	601.23	4.87	244.58	604.50	403.75	110.01
TIT-206	Material Thermocouple #4	Deg.F	39.45	69.98	43.49	2.42	69.98	537.75	362.88	105.69	526.88	550.88	542.63	3.71	127.05	526.88	231.03	102.06
TIT-207	Material Thermocouple #5	Deg.F	39.38	69.60	43.31	2.38	69.60	669.00	470.57	126.88	637.65	672.83	659.49	4.76	175.58	637.65	327.60	114.72
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	44	1827	1731	216	1780	1831	1809	8	1782	1850	1816	16	896	1843	1738	178
FIT-149	Fumes Flow	PPH	2102	2560	2342	55	2116	2594	2333	47	2107	2322	2191	27	2099	4000	3071	430
PIT-151	Fumes Pressure	InWC	0.34	0.70	0.52	0.04	0.29	0.75	0.43	0.06	0.27	0.36	0.32	0.01	0.34	2.01	1.16	0.41
TIT-145	Combustor Temperature	Deg. F	46	1832	1739	210	1783	1841	1815	9	1786	1850	1823	18	854	1850	1738	189
PIT-139	Fuel Pressure	PSIG	0.08	0.84	0.82	0.05	0.04	0.82	0.28	0.18	0.04	0.22	0.10	0.05	0.01	0.85	0.57	0.32
[illegible]-121	Fuel Gas Flow	CFH	477	1109	1081	41	342	1092	680	127	330	681	498	113	1	1100	840	332
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.78	86.90	2.52	14.69	-0.23	63.93	2.01	3.20	2.30	4.10	3.08	0.34	-0.30	2.30	-0.14	0.30
THC-B	Interconnecting Duct THC	ppm	-62.95	100.00	12.44	27.07	26.52	100.00	36.75	10.37	26.25	36.22	29.66	1.45	2.14	71.66	8.70	17.43
CO	Stack's CO	ppm	-0.50	497.00	54.01	103.44	0.00	0.50	0.00	0.04	0.00	0.50	0.00	0.02	0.00	3.00	0.04	0.26
THC	Stack's THC	ppm	-0.63	0.52	-0.13	0.52	-0.6	-0.62	-0.62	0.00	-0.62	-0.62	-0.62	0.00	-0.63	0.54	-0.56	0.23
NOx	Stack's NOx	ppm	0.13	90.08	33.06	30.90	43.30	134.55	65.80	8.09	44.35	103.18	71.89	15.09	1.40	129.53	64.01	27.98
SO2	Stack SO2	ppm	-1.50	129.00	3.73	21.63	-0.50	1.00	0.03	0.28	-0.50	0.50	-0.02	0.23	-1.00	0.00	-0.29	0.25
O2	Stack's O2	%	-0.08	17.60	9.09	4.83	10.63	14.38	12.49	0.49	10.20	14.63	12.36	1.21	11.20	22.30	15.17	2.14
CO2	Stack's CO2	%	-0.20	22.82	3.42	4.46	0.62	0.98	0.76	0.05	0.60	1.04	0.83	0.10	-0.06	0.92	0.60	0.20
TIT-300	Ambient Temp	Deg. F	37.04	42.44	39.54	1.35	41.72	52.70	47.77	2.85	46.22	50.54	48.10	0.88	43.16	46.94	45.31	0.80

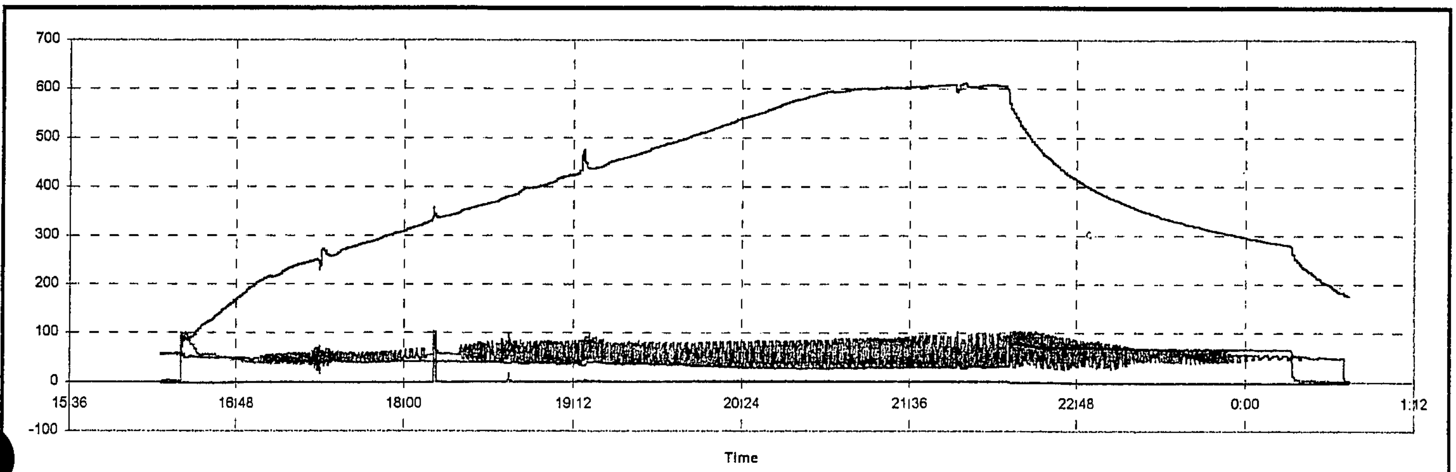


SUMMARY OF DATA

Date: 14-Feb-96
Time: 0:45

Test Number: 7
Soak Time: 1 Hrs.
Soak Temp: Greater than 600 F

			16:16	WARM		16:24	16:24	RAMP		21:13	21:13	SOAK		22:18	22:18	COOL		0:19
Tag	Parameter Description	Unit	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.61	10.62	3.85	1.22	3.73	11.69	10.84	0.89	9.45	11.76	11.47	0.19	4.42	9.45	8.74	0.20
FIT-231	Fuel Gas Flow	CFH	-1.15	135.35	3.64	23.88	-1.10	139.15	98.81	27.30	52.90	137.35	119.81	8.83	-0.63	52.90	40.49	1.98
PIT-222	Combustion Air Pressure	In.WC	22.81	24.13	22.89	0.22	22.87	24.84	24.47	0.25	24.45	24.96	24.81	0.06	23.47	24.47	24.33	0.06
FIT-221	Combustion Air Flow	CFH	10275	12045	11964	304	10052	11984	10245	201	10091	10672	10163	52	10672	11927	10866	51
PIT-158	Chamber Pressure (Draft)	In.WC	-0.48	-0.19	-0.31	0.04	-0.59	-0.14	-0.38	0.12	-0.50	-0.40	-0.44	0.01	-0.48	-0.18	-0.25	0.05
TIT-201	Recorder Temperature	Deg.F	58.88	80.25	60.05	3.71	80.25	651.90	429.55	147.30	622.20	656.85	646.70	4.45	265.65	635.85	356.45	79.14
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	59.33	81.08	60.34	3.79	81.08	656.03	432.51	148.11	624.83	660.68	650.28	4.52	266.70	639.30	357.18	79.11
TIT-203	Material Thermocouple #1	Deg.F	60.08	62.10	60.38	0.34	62.10	623.33	387.92	154.42	623.33	632.93	629.45	1.98	295.13	630.00	406.04	91.70
TIT-204	Material Thermocouple #2	Deg.F	58.73	78.15	59.65	3.41	76.05	646.05	408.30	155.07	640.95	648.30	645.95	1.73	280.13	640.95	362.48	77.15
TIT-205	Material Thermocouple #3	Deg.F	53.40	56.55	53.80	0.52	56.55	466.65	279.27	108.38	465.83	514.30	493.62	14.53	313.50	513.90	392.94	54.97
TIT-206	Material Thermocouple #4	Deg.F	59.70	76.65	60.57	2.92	76.28	609.15	367.01	134.30	554.78	582.30	575.54	3.70	218.63	566.93	299.91	81.54
TIT-207	Material Thermocouple #5	Deg.F	59.93	92.85	61.24	5.73	88.65	690.38	466.24	151.72	640.95	697.35	681.19	7.01	290.63	664.43	383.65	78.31
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1652	1774	1735	39	1704	1850	1801	28	1756	1850	1806	34	1756	1850	1806	23
FIT-149	Fumes Flow	PPH	2199	2401	2298	33	2056	2449	2205	92	2023	2131	2073	12	2053	2545	2437	103
PIT-151	Fumes Pressure	InWC	0.38	0.55	0.48	0.03	0.26	0.61	0.38	0.08	0.24	0.31	0.28	0.01	0.27	0.69	0.58	0.09
TIT-145	Combustor Temperature	Deg. F	1549	1656	1621	34	1579	1741	1678	30	1630	1738	1683	37	1631	1738	1681	24
PIT-133	Fuel Pressure	PSIG	0.81	0.82	0.82	0.00	0.07	0.82	0.44	0.19	0.06	0.62	0.30	0.21	0.06	0.73	0.50	0.15
TIT-121	Fuel Gas Flow	CFH	1100	1102	1101	0	240	1102	693	229	236	876	522	247	239	972	751	184
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-1.63	-1.55	-1.58	0.01	-1.58	86.30	0.81	3.41	0.20	2.45	1.85	0.30	-1.33	1.63	-1.16	0.26
THC-B	Interconnecting Duct THC	ppm	-2.22	100.00	5.68	16.94	15.99	100.00	38.82	9.91	27.25	44.18	30.09	2.05	31.17	80.29	68.80	3.98
CO	Stack's CO	ppm	0.00	0.00	0.00	0.00	-0.50	1.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.02
THC	Stack's THC	ppm	100.00	100.00	100.00	0.00	-1.6	100.00	7.16	28.12	-1.57	-1.22	-1.41	0.07	-1.62	-1.26	-1.46	0.07
NOx	Stack's NOx	ppm	56.03	59.43	57.25	0.94	23.68	102.33	56.12	15.38	30.60	102.48	58.32	23.79	26.73	102.50	57.14	17.19
SO2	Stack SO2	ppm	2.00	2.50	2.08	0.18	0.50	2.50	1.36	0.36	1.00	2.00	1.55	0.17	1.00	2.00	1.52	0.15
O2	Stack's O2	%	11.40	11.63	11.49	0.06	7.58	14.33	11.14	1.52	7.63	14.18	11.20	2.19	7.85	15.48	12.30	1.23
CO2	Stack's CO2	%	6.42	6.56	6.50	0.04	4.06	9.84	6.79	1.29	4.28	9.80	6.80	1.87	3.30	9.64	5.84	1.00
TIT-300	Ambient Temp	Deg. F	55.40	56.66	56.00	0.29	44.78	58.82	49.17	3.31	43.52	46.22	44.68	0.57	42.80	45.86	44.05	0.54

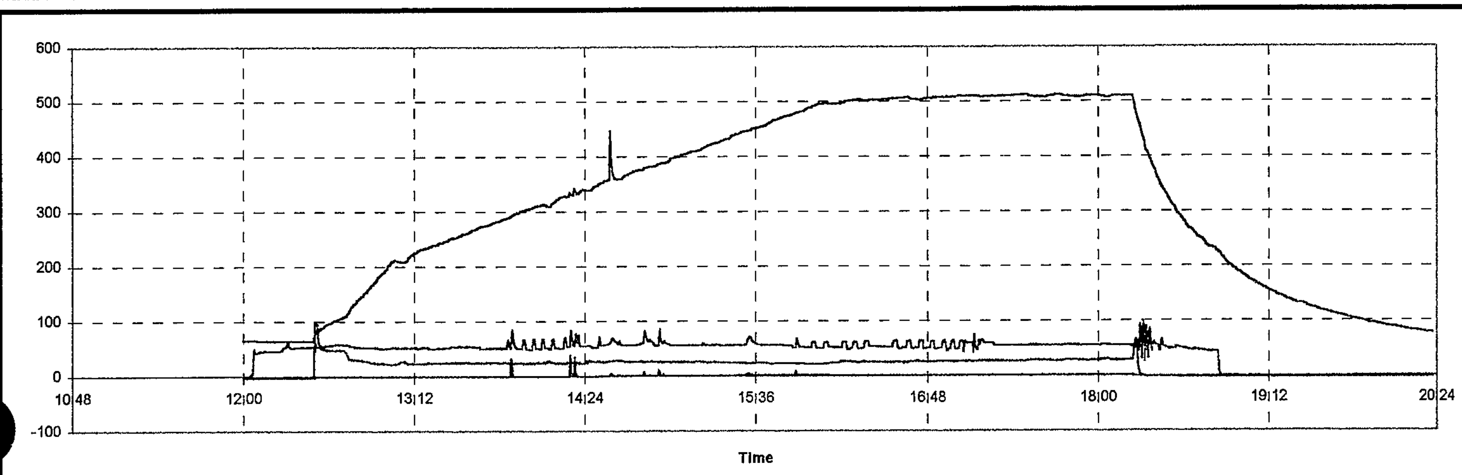


SUMMARY OF DATA

Date: 15-Feb-96
Time: 20:25

Test Number: 8
Soak Time: 2 Hrs.
Soak Temp: Greater than 500 F

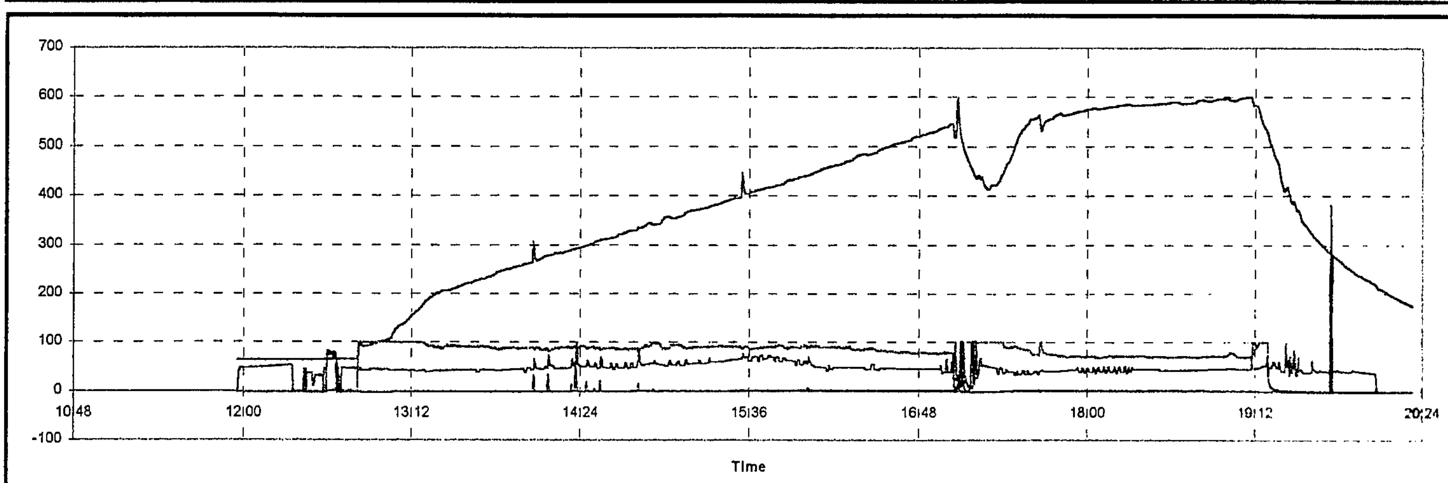
			12:03 WARM 12:29				12:29 RAMP 16:13				16:13 SOAK 18:15				18:15 COOL 18:18			
Tag	*Parameter Description*	*Unit*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	2.70	9.86	3.19	0.74	5.26	11.85	10.29	1.38	4.37	11.78	11.36	1.26	4.52	9.28	6.46	2.27
FIT-231	Fuel Gas Flow	CFH	-1.60	135.95	-0.20	13.29	1.38	135.95	81.06	25.67	-0.73	115.95	93.17	18.78	-0.73	37.95	14.13	19.52
PIT-222	Combustion Air Pressure	In.WC	22.11	23.53	22.31	0.17	22.72	23.72	23.46	0.18	22.30	23.98	23.74	0.27	22.37	23.45	22.80	0.51
FIT-221	Combustion Air Flow	CFH	10236	12083	11959	184	10166	11302	10565	253	10641	12881	10839	372	11517	12858	12291	625
PIT-158	Chamber Pressure (Draft)	In.WC	-1.00	-0.27	-0.67	0.30	-1.00	-0.58	-0.75	0.12	-0.61	-0.17	-0.56	0.07	-0.39	-0.17	-0.22	0.08
TIT-201	Recorder Temperature	Deg.F	63.23	66.60	63.88	0.61	66.60	552.45	373.83	122.60	360.53	551.93	542.03	25.33	406.43	521.40	465.09	38.53
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	63.53	66.45	64.21	0.61	66.30	556.28	376.67	123.33	357.53	555.60	545.24	26.31	404.03	523.88	465.22	40.03
TIT-203	Material Thermocouple #1	Deg.F	63.75	67.73	64.78	0.69	67.73	523.50	347.39	118.31	408.15	525.83	516.68	11.74	473.10	505.43	489.25	8.95
TIT-204	Material Thermocouple #2	Deg.F	65.33	66.30	65.68	0.22	65.93	414.68	270.51	90.80	371.63	461.63	439.50	15.46	394.35	451.28	424.67	19.78
TIT-205	Material Thermocouple #3	Deg.F	65.93	67.20	66.45	0.36	65.93	507.45	313.12	125.94	499.28	530.70	525.15	6.18	515.93	529.58	523.76	4.37
TIT-206	Material Thermocouple #4	Deg.F	64.05	66.00	64.55	0.41	65.10	483.15	312.14	113.17	407.70	489.30	484.60	10.47	432.98	474.30	451.77	12.95
TIT-207	Material Thermocouple #5	Deg.F	65.70	70.05	66.31	0.50	70.05	873.00	402.12	126.27	390.08	581.93	567.32	25.56	436.20	533.10	481.28	30.39
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	78	1743	1493	392	1741	1850	1809	18	1756	1850	1815	20	1779	1832	1804	15
FIT-149	Fumes Flow	PPH	2103	2588	2380	95	1968	2588	2104	103	1960	2732	2012	101	2149	2584	2340	114
PIT-151	Fumes Pressure	InWC	0.37	0.73	0.55	0.06	0.20	0.73	0.31	0.09	0.20	0.81	0.25	0.08	0.36	0.69	0.49	0.09
TIT-145	Combustor Temperature	Deg. F	83	1759	1516	388	1756	1876	1822	20	1762	1888	1828	23	1788	1847	1815	17
PIT-133	Fuel Pressure	PSIG	0.02	0.81	0.79	0.11	0.30	0.81	0.45	0.13	0.15	0.80	0.35	0.06	0.15	0.61	0.40	0.13
FIT-121	Fuel Gas Flow	CFH	138	1108	1084	131	510	1103	728	150	329	1063	572	71	369	879	629	148
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.68	-0.58	-0.62	0.03	-0.63	38.05	0.92	2.57	-0.60	1.60	0.89	0.34	-0.45	0.18	-0.27	0.17
THC-B	Interconnecting Duct THC	ppm	-2.50	-1.34	-2.32	0.21	-2.46	100.00	26.99	8.60	-0.70	61.55	26.97	5.57	1.72	61.55	34.99	25.74
CO	Stack's CO	ppm	-0.50	131.50	4.19	21.25	-1.00	-0.50	-0.50	0.02	-0.50	-0.50	-0.50	0.00	-0.50	-0.50	-0.50	0.00
THC	Stack's THC	ppm	-4.51	54.10	-3.07	6.68	-5.1	-3.60	-4.72	0.16	-5.12	-4.75	-4.92	0.07	-5.10	-4.85	-4.99	0.07
NOx	Stack's NOx	ppm	2.10	63.30	48.33	10.29	47.28	86.60	56.45	5.23	26.63	98.25	56.34	5.80	45.15	94.00	63.33	14.42
SO2	Stack SO2	ppm	0.50	1.00	0.78	0.25	0.00	1.00	0.75	0.25	0.00	1.00	0.49	0.16	0.00	0.50	0.46	0.14
O2	Stack's O2	%	11.68	20.93	12.89	1.61	10.05	12.53	11.63	0.35	9.78	16.38	11.77	0.64	12.00	14.65	12.92	0.81
CO2	Stack's CO2	%	0.04	5.96	5.16	1.01	5.28	6.90	5.93	0.22	2.66	7.20	5.84	0.42	3.90	5.74	5.07	0.55
TIT-300	Ambient Temp	Deg. F	57.38	59.72	58.73	0.48	53.24	61.88	57.52	2.31	45.14	54.68	49.44	2.06	45.14	46.94	46.14	0.51



SUMMARY OF DATA

Date:	19-Feb-96	Test Number:	9
Time:	20:45	Soak Time:	0 Hrs.
		Soak Temp:	Greater than 600 F

			11:57	WARM		12:49	12:49	RAMP		19:08	19:08	SOAK		19:10	19:10	COOL		20:45
Tag	**Parameter Description**	**Unit**	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.97	11.37	4.10	0.67	3.96	13.65	11.07	1.46	11.77	11.84	11.80	0.02	3.49	11.82	4.21	1.60
FIT-231	Fuel Gas Flow	CFH	-1.60	132.18	-0.23	11.83	-1.38	381.33	100.48	38.12	123.75	127.53	124.32	1.30	-1.03	123.75	3.69	18.98
PIT-222	Combustion Air Pressure	In.WC	21.38	23.11	21.50	0.16	21.48	23.82	23.24	0.43	23.63	23.73	23.67	0.03	21.54	23.64	21.90	0.40
FIT-221	Combustion Air Flow	CFH	10681	12769	12703	193	10391	12842	10731	404	10559	10584	10573	9	1	12941	12693	792
PIT-158	Chamber Pressure (Draft)	In.WC	-0.44	-0.19	-0.37	0.02	-0.89	-0.14	-0.45	0.10	-0.57	-0.56	-0.57	0.00	-1.00	1100.2	2.20	56.25
TIT-201	Recorder Temperature	Deg.F	65.55	78.60	66.40	1.00	78.60	661.28	467.83	154.72	652.43	653.25	652.70	0.29	-1.20	653.25	244.77	137.15
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	65.93	78.30	66.64	0.94	78.30	668.40	471.18	155.86	656.70	657.53	656.97	0.25	-0.36	657.53	243.36	137.27
TIT-203	Material Thermocouple #1	Deg.F	67.35	83.48	68.36	1.13	83.48	645.30	413.67	141.57	589.80	593.18	591.11	1.03	-0.50	593.63	221.66	137.07
TIT-204	Material Thermocouple #2	Deg.F	57.60	61.73	58.73	0.71	61.73	531.53	332.45	128.77	531.53	532.58	531.96	0.35	-1.06	532.80	311.80	100.12
TIT-205	Material Thermocouple #3	Deg.F	62.03	65.10	63.66	0.81	65.10	624.23	403.19	169.36	624.23	624.98	624.55	0.24	41.80	625.28	348.82	143.76
TIT-206	Material Thermocouple #4	Deg.F	66.15	78.98	66.83	0.93	78.98	591.60	408.01	134.61	574.73	575.70	575.24	0.30	0.50	575.33	219.42	120.97
TIT-207	Material Thermocouple #5	Deg.F	65.78	81.53	66.71	1.14	81.53	774.60	497.77	156.96	679.35	680.33	679.81	0.33	13.33	679.35	267.88	141.38
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	592	1802	1715	182	1282	1850	1792	48	1815	1816	1815	0	5	1850	1198	485
FIT-147	Fumes Flow	PPH	2372	2569	2446	31	1760	2511	2153	112	2021	2057	2043	11	56	4000	3423	635
PIT-151	Fumes Pressure	InWC	0.51	0.65	0.56	0.01	-0.04	0.60	0.31	0.08	0.23	0.26	0.25	0.01	0.17	296.49	2.25	15.08
TIT-145	Combustor Temperature	Deg. F	572	1814	1729	180	1261	1906	1804	52	1829	1829	1829	0	193	1873	1191	704
PIT-133	Fuel Pressure	PSIG	0.75	0.80	0.79	0.02	0.00	0.83	0.41	0.12	0.31	0.32	0.32	0.00	0.01	38.00	0.48	1.96
TIT-121	Fuel Gas Flow	CFH	1053	1104	1092	15	1	1100	647	152	531	531	531	0	0	1102	519	493
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-1.35	80.85	4.85	21.08	-1.28	51.85	1.11	2.66	1.20	1.43	1.33	0.08	-1.25	244.28	-0.47	12.56
THC-B	Interconnecting Duct THC	ppm	-2.33	100.00	3.94	13.22	7.13	100.00	84.53	13.11	69.12	71.03	69.88	0.62	-1.54	241.58	8.15	28.40
CO	Stack's CO	ppm	-1.00	125.00	18.79	42.44	-1.00	425.50	1.81	23.56	-0.50	-0.50	-0.50	0.00	-0.50	202.95	0.46	10.65
THC	Stack's THC	ppm	-5.28	0.75	-2.88	2.26	-1.1	26.58	-0.82	1.48	-1.12	-0.93	-1.03	0.07	-1.21	331.13	0.51	17.08
NOx	Stack's NOx	ppm	-1.30	83.78	38.21	24.44	0.80	103.33	48.79	10.62	45.60	45.85	45.74	0.07	-1.20	381.98	25.69	30.07
SO2	Stack SO2	ppm	-1.50	122.00	8.29	31.82	-1.50	0.50	-0.41	0.43	0.00	0.50	0.06	0.18	0.00	222.08	0.88	11.35
O2	Stack's O2	%	-0.28	19.85	9.22	5.05	8.28	20.63	11.50	1.13	11.08	11.10	11.08	0.01	10.95	272.10	17.24	13.61
CO2	Stack's CO2	%	-0.12	5.48	4.15	2.11	0.14	8.16	5.94	0.72	6.18	6.20	6.19	0.01	-0.06	1771.6	7.25	90.54
TIT-300	Ambient Temp	Deg. F	62.42	65.48	63.80	0.74	55.40	68.90	60.49	4.06	55.40	55.76	55.63	0.19	55.04	3185.5	63.88	160.14

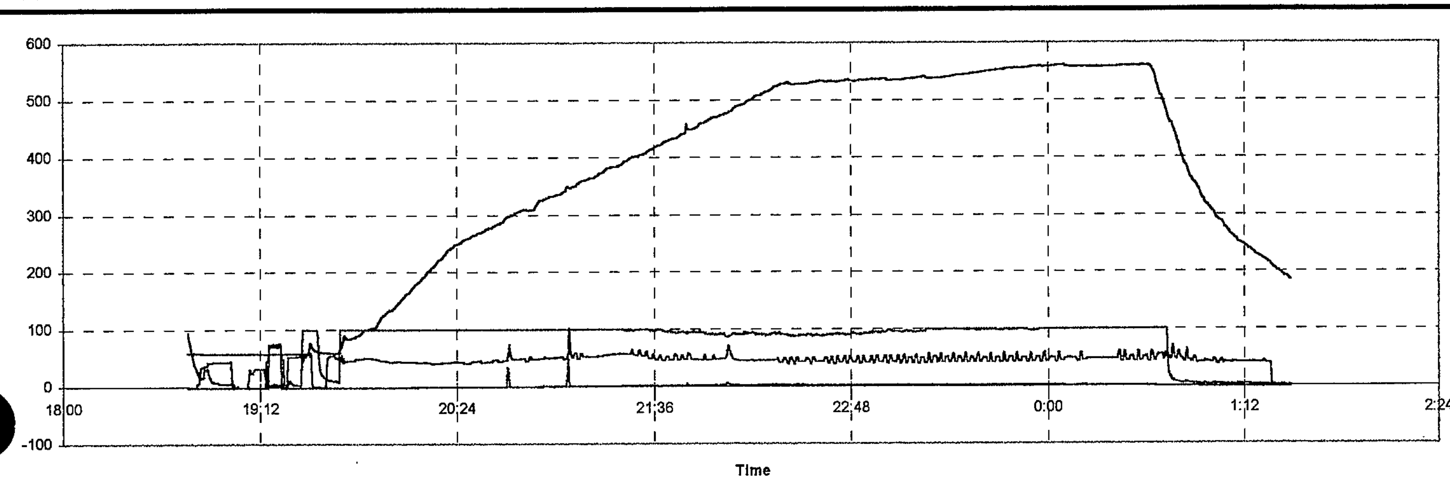


SUMMARY OF DATA

Date: 20-Feb-96
Time: 6:45

Test Number: 10
Soak Time: 1 Hrs.
Soak Temp: Greater than 550 F

			18:49	WARM		19:41	19:41	RAMP		23:37	23:37	SOAK		0:38	0:38	COOL		1:29
Tag	***Parameter Description***	***Unit***	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*	*Min.*	*Max.*	*Ave.*	*Std.*
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.97	11.42	4.32	0.69	3.97	12.87	12.02	1.11	11.87	12.49	12.38	0.08	3.88	11.92	4.77	1.69
FIT-231	Fuel Gas Flow	CFH	-1.10	121.68	3.25	20.60	-0.85	147.08	106.57	29.88	85.33	119.45	111.43	4.48	-0.70	85.33	3.66	14.24
PIT-222	Combustion Air Pressure	In.WC	22.19	23.89	22.31	0.17	22.19	24.53	24.22	0.30	24.36	24.53	24.41	0.03	22.50	24.40	22.72	0.40
FIT-221	Combustion Air Flow	CFH	10895	13030	12925	197	10570	12983	10795	294	10680	10922	10732	31	10922	13153	12889	473
PIT-158	Chamber Pressure (Draft)	In.WC	-0.84	-0.18	-0.37	0.10	-0.84	-0.17	-0.24	0.06	-0.25	-0.17	-0.24	0.01	-0.89	-0.1	-0.46	0.21
TIT-201	Recorder Temperature	Deg.F	55.95	84.45	58.76	4.57	71.33	606.53	451.38	153.98	596.70	613.43	609.18	2.32	157.65	596.70	287.75	111.12
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	56.18	85.80	58.97	4.69	71.70	610.73	455.15	154.95	599.85	617.85	613.09	2.41	156.53	599.85	285.91	111.56
TIT-203	Material Thermocouple #1	Deg.F	57.75	75.90	60.00	3.17	68.63	564.23	405.43	145.80	559.73	573.98	568.70	2.59	168.60	559.73	312.11	119.41
TIT-204	Material Thermocouple #2	Deg.F	59.48	69.83	60.88	1.45	63.23	443.33	306.20	112.28	443.33	483.38	464.73	11.77	222.68	483.00	328.46	74.03
TIT-205	Material Thermocouple #3	Deg.F	57.60	60.60	59.08	0.94	60.08	579.90	396.11	166.54	579.90	592.20	588.98	2.91	235.80	590.18	388.98	110.69
TIT-206	Material Thermocouple #4	Deg.F	56.85	85.73	59.02	3.82	73.88	526.58	376.17	134.70	512.18	533.10	528.50	2.33	139.35	512.18	245.69	93.16
TIT-207	Material Thermocouple #5	Deg.F	58.43	102.30	61.24	5.99	79.80	647.25	483.87	161.11	616.50	648.45	641.64	3.85	166.88	616.50	299.04	112.90
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	81	1850	1571	351	1764	1850	1810	15	1782	1848	1807	14	674	1819	1661	295
FIT-149	Fumes Flow	PPH	1534	2627	2321	125	1986	2676	2166	91	1966	2057	1998	12	2057	4000	3192	509
PIT-151	Fumes Pressure	InWC	0.06	0.77	0.51	0.08	0.15	0.77	0.35	0.08	0.22	0.28	0.23	0.01	0.28	2.00	1.30	0.47
TIT-145	Combustor Temperature	Deg. F	89	1905	1587	355	1781	1873	1823	17	1792	1867	1821	16	622	1831	1662	315
PIT-133	Fuel Pressure	PSIG	0.00	0.82	0.73	0.25	0.28	0.83	0.47	0.13	0.27	0.40	0.32	0.03	0.01	0.85	0.61	0.31
[illegible]-121	Fuel Gas Flow	CFH	1	1105	983	333	467	1105	695	153	466	652	529	55	1	1097	811	395
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.48	76.93	6.26	21.17	-0.40	48.58	1.94	2.61	1.30	2.58	2.19	0.19	-0.15	1.33	0.01	0.25
THC-B	Interconnecting Duct THC	ppm	-1.21	100.00	22.41	29.93	86.21	100.00	96.93	3.95	96.43	100.00	99.65	0.70	1.19	100.00	14.50	29.85
CO	Stack's CO	ppm	-0.50	204.50	22.57	45.83	-0.50	-0.50	-0.50	0.00	-0.50	-0.50	-0.50	0.00	-0.50	22.00	-0.10	2.16
THC	Stack's THC	ppm	-1.07	100.00	5.69	20.62	-1.4	-0.82	-1.19	0.09	-1.46	-1.08	-1.27	0.06	-1.44	17.25	-0.50	2.59
NOx	Stack's NOx	ppm	-0.45	73.78	31.83	26.13	39.35	102.25	48.59	5.70	42.90	61.70	49.06	4.46	0.58	71.00	39.14	16.70
SO2	Stack SO2	ppm	2.00	137.00	15.75	35.42	2.50	4.50	3.54	0.48	4.00	4.50	4.13	0.22	4.00	4.50	4.26	0.25
O2	Stack's O2	%	-0.23	20.85	9.51	6.34	10.05	12.45	11.38	0.46	10.13	12.40	11.55	0.55	10.85	20.98	14.61	2.57
CO2	Stack's CO2	%	-0.14	6.90	3.54	2.60	5.44	7.02	6.17	0.29	5.48	6.92	6.04	0.36	0.02	6.4	4.01	1.63
TIT-300	Ambient Temp	Deg. F	48.20	52.88	50.87	0.96	41.72	56.66	45.87	2.32	41.36	44.78	43.06	0.69	40.46	43.5	41.85	0.66

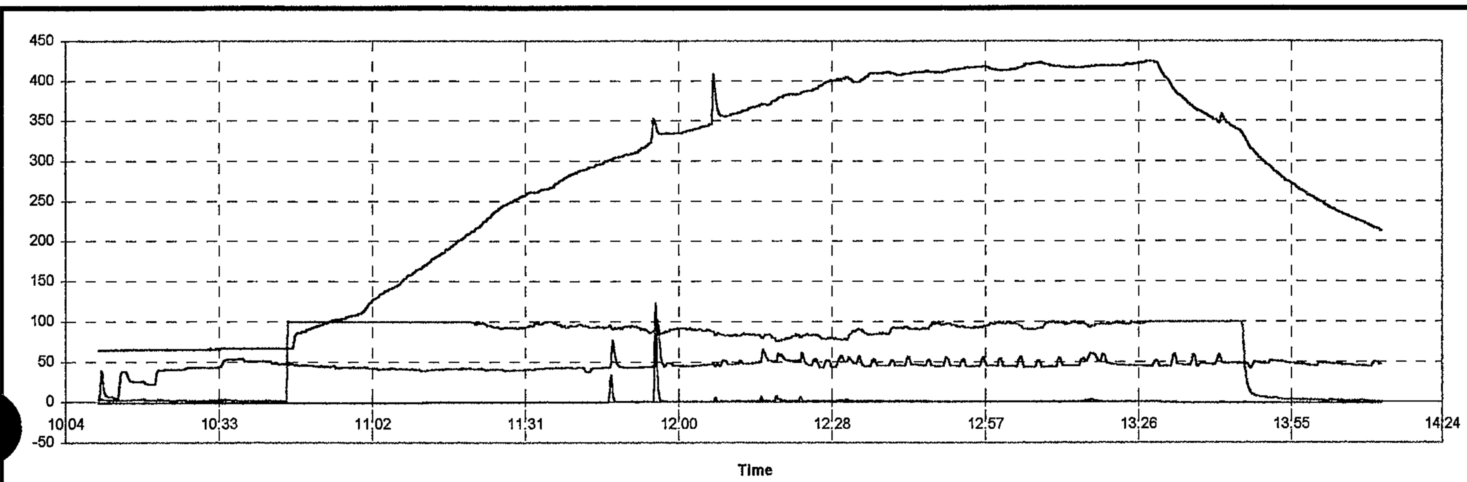


SUMMARY OF DATA

Test Number: 11
Soak Time: 1 Hrs.
Soak Temp: Greater than 400 F

Date: 22-Feb-96
Time: 14:30

			10:11	WARM		10:47	10:47	RAMP		12:28	12:28	SOAK		13:32	13:32	COOL		14:12
Tag	Parameter Description	Unit	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	4.03	4.42	4.10	0.04	4.12	11.62	10.69	1.21	8.53	11.57	11.06	0.34	4.02	11.68	5.55	2.09
FIT-231	Fuel Gas Flow	CFH	-1.58	117.10	-0.56	9.94	-1.45	139.90	79.76	32.83	24.10	112.30	92.34	10.69	-1.58	136.63	2.77	14.33
PIT-222	Combustion Air Pressure	In.WC	21.44	21.72	21.53	0.07	21.47	23.16	22.91	0.24	22.33	23.04	22.91	0.08	21.10	23.00	21.61	0.54
FIT-221	Combustion Air Flow	CFH	12655	12813	12727	32	10419	12692	10753	369	10439	11345	10607	95	10373	12628	12181	581
PIT-158	Chamber Pressure (Draft)	In.WC	-0.40	-0.19	-0.33	0.05	-0.34	-0.14	-0.26	0.02	-0.48	-0.25	-0.41	0.06	-0.45	0.0	-0.23	0.08
TIT-201	Recorder Temperature	Deg.F	66.60	68.85	67.98	0.56	68.48	454.50	300.86	106.24	417.98	459.30	452.15	5.16	185.40	417.98	272.69	69.02
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	66.75	69.00	68.14	0.57	68.55	457.58	303.16	107.00	419.33	462.38	454.82	5.39	184.43	419.33	271.87	69.96
TIT-203	Material Thermocouple #1	Deg.F	68.03	70.88	69.46	0.81	70.13	503.33	289.18	117.47	449.10	469.95	463.47	3.87	231.75	457.05	339.50	68.02
TIT-204	Material Thermocouple #2	Deg.F	64.80	67.43	66.13	0.73	67.13	395.03	240.91	102.43	395.03	435.98	424.71	9.88	246.45	432.98	336.00	57.15
TIT-205	Material Thermocouple #3	Deg.F	61.95	63.23	62.54	0.35	62.93	271.58	166.49	62.45	264.75	326.55	299.46	17.53	220.65	310.88	257.29	24.94
TIT-206	Material Thermocouple #4	Deg.F	66.83	69.30	68.32	0.68	69.15	389.70	257.75	88.55	362.33	405.00	396.27	5.58	166.73	362.33	248.18	59.30
TIT-207	Material Thermocouple #5	Deg.F	66.08	69.00	67.88	0.69	69.00	731.78	337.42	120.49	443.18	505.13	491.94	8.12	207.30	443.18	303.03	71.84
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	339	1801	1501	376	1777	1827	1804	11	1784	1831	1805	13	1767	1828	1797	12
FIT-147	Fumes Flow	PPH	1969	2530	2388	107	2178	2384	2274	40	2099	2201	2146	16	2146	2545	2369	134
PIT-151	Fumes Pressure	InWC	0.20	0.57	0.49	0.07	0.31	0.51	0.38	0.04	0.26	0.31	0.28	0.01	0.30	0.65	0.48	0.12
TIT-145	Combustor Temperature	Deg. F	366	1820	1526	367	1786	1843	1817	11	1794	1847	1817	15	1775	1844	1808	13
PIT-133	Fuel Pressure	PSIG	0.05	0.80	0.69	0.20	0.41	0.77	0.56	0.09	0.39	0.50	0.42	0.03	0.41	0.68	0.55	0.08
[illegible]-121	Fuel Gas Flow	CFH	269	1104	995	214	627	1073	826	108	621	771	652	45	622	969	804	97
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.48	-0.38	-0.43	0.03	-0.48	122.38	1.32	7.09	0.05	4.58	1.32	0.59	-0.63	0.08	-0.41	0.14
THC-B	Interconnecting Duct THC	ppm	1.53	100.00	5.16	16.21	75.70	100.00	93.10	6.88	77.29	100.00	93.90	5.75	0.33	100.00	38.10	45.87
CO	Stack's CO	ppm	-0.50	102.00	9.05	25.44	-0.50	-0.50	-0.50	0.00	-0.50	-0.50	-0.50	0.00	-0.50	-0.50	-0.50	0.00
THC	Stack's THC	ppm	-1.28	2.08	-0.93	0.63	-1.4	-1.04	-1.26	0.07	-1.46	-1.18	-1.32	0.05	-1.50	-1.21	-1.35	0.06
NOx	Stack's NOx	ppm	3.10	54.38	39.68	13.35	37.90	102.45	45.29	6.51	43.80	60.76	48.08	4.13	42.60	59.70	48.48	2.97
SO2	Stack SO2	ppm	6.50	7.00	6.54	0.13	6.50	7.00	6.51	0.07	6.50	7.00	6.59	0.19	6.50	7.00	6.55	0.15
O2	Stack's O2	%	11.48	19.60	13.04	1.83	10.60	12.28	11.52	0.25	10.55	12.73	11.71	0.44	11.78	14.05	13.03	0.37
CO2	Stack's CO2	%	0.92	6.06	5.05	1.20	5.56	6.64	6.05	0.17	5.22	6.68	5.92	0.29	4.36	5.9	5.04	0.25
TIT-300	Ambient Temp	Deg. F	64.22	66.20	65.18	0.48	64.58	67.64	66.15	0.71	65.84	68.18	67.29	0.46	67.28	72.1	69.13	1.31

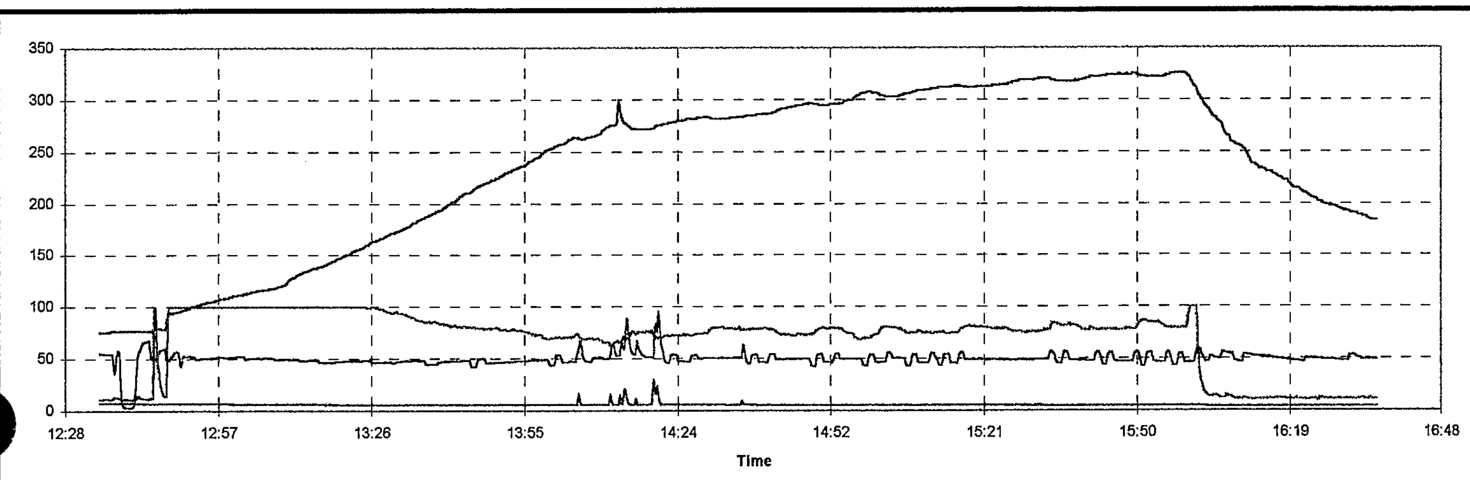


SUMMARY OF DATA

Date: 26-Feb-96
Time: 18:40

Test Number: 12
Soak Time: 1 Hrs.
Soak Temp: Greater than 300 F

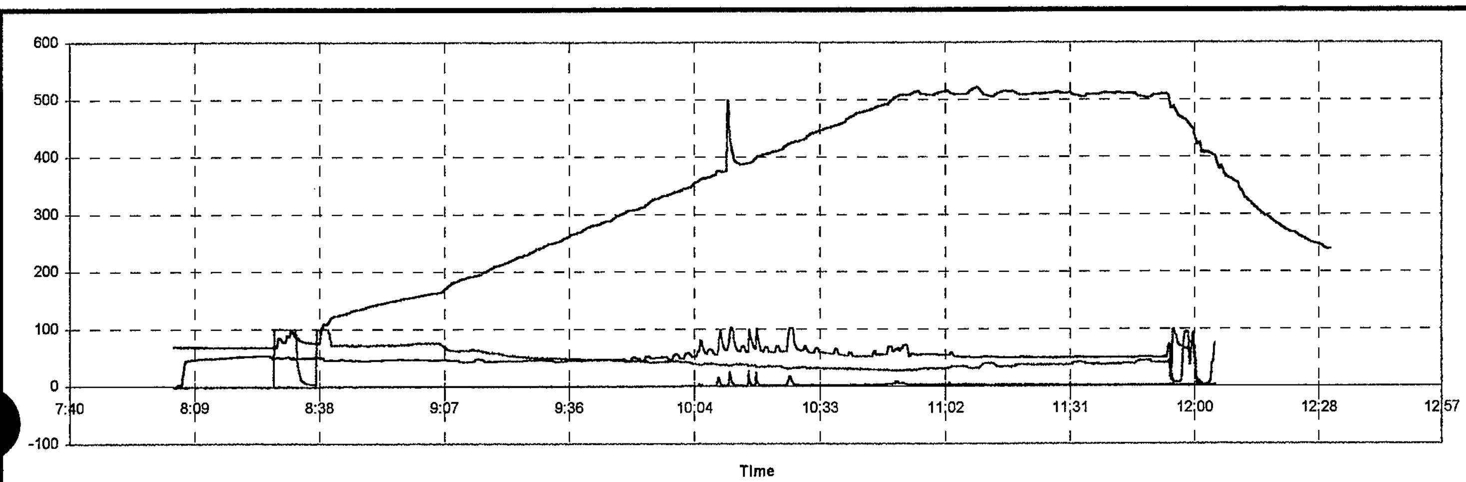
Tag	Parameter Description	Unit	12:35 WARM 12:47				12:47 RAMP 14:55				14:55 SOAK 16:02				16:02 COOL 16:41			
			Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.68	7.83	4.03	0.59	5.39	10.84	9.73	1.18	4.20	10.74	10.19	0.93	3.93	4.20	3.99	0.05
FIT-231	Fuel Gas Flow	CFH	-2.13	99.20	0.79	15.21	0.48	132.50	57.84	28.78	-1.73	83.88	67.45	14.28	-1.73	-1.50	-1.64	0.05
PIT-222	Combustion Air Pressure	In.WC	20.77	22.16	20.87	0.19	20.82	22.51	22.20	0.27	21.09	22.52	22.36	0.20	20.97	21.11	21.03	0.03
FIT-221	Combustion Air Flow	CFH	11052	12559	12463	205	10445	12400	10802	357	10502	12461	10684	278	12448	12580	12536	19
PIT-158	Chamber Pressure (Draft)	In.WC	-0.67	0.00	-0.28	0.09	-0.42	-0.13	-0.22	0.02	-0.23	-0.18	-0.20	0.01	-0.29	-0.2	-0.24	0.02
TIT-201	Recorder Temperature	Deg.F	80.48	86.48	81.99	1.72	84.30	363.68	272.51	86.49	300.15	376.43	366.64	8.93	153.68	300.15	195.82	33.94
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	80.55	86.85	82.23	1.75	84.45	366.45	274.35	87.07	299.10	379.50	368.86	9.30	153.23	299.10	194.67	33.59
TIT-203	Material Thermocouple #1	Deg.F	81.08	86.78	82.51	1.81	85.50	363.08	263.26	91.55	362.03	375.83	371.95	2.57	146.78	362.03	213.54	63.61
TIT-204	Material Thermocouple #2	Deg.F	63.00	64.28	63.57	0.33	64.05	176.93	110.10	35.17	176.93	228.53	205.91	15.35	206.55	228.45	216.23	6.18
TIT-205	Material Thermocouple #3	Deg.F	77.70	79.58	78.34	0.52	79.13	283.13	186.92	67.03	282.83	341.10	317.42	17.93	213.90	325.43	262.50	31.39
TIT-206	Material Thermocouple #4	Deg.F	81.15	87.08	82.37	1.51	84.00	296.18	225.93	66.08	263.10	304.80	299.15	5.72	136.95	263.10	178.51	32.68
TIT-207	Material Thermocouple #5	Deg.F	80.78	88.43	82.23	1.90	84.08	493.88	283.80	92.96	322.65	396.98	385.86	8.87	173.10	322.65	222.69	39.03
[illegible]																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1125	1803	1624	224	1772	1837	1807	10	1776	1837	1804	13	1774	1816	1797	10
FIT-149	Fumes Flow	PPH	1122	2962	2290	248	2053	2514	2206	68	2162	2381	2221	19	2345	2539	2467	42
PIT-151	Fumes Pressure	InWC	-0.06	1.04	0.44	0.16	0.22	0.59	0.33	0.05	0.32	0.51	0.36	0.02	0.50	0.66	0.61	0.04
TIT-145	Combustor Temperature	Deg. F	1087	1820	1629	244	1780	1854	1819	11	1783	1851	1815	14	1781	1827	1806	10
PIT-133	Fuel Pressure	PSIG	0.00	0.79	0.60	0.31	0.42	0.79	0.53	0.08	0.42	0.52	0.46	0.03	0.47	0.69	0.63	0.05
FIT-121	Fuel Gas Flow	CFH	0	1102	838	450	652	1102	809	94	645	795	717	44	727	984	907	57
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	7.45	8.18	7.79	0.21	5.65	29.80	6.61	1.97	4.75	5.78	5.27	0.27	4.23	4.83	4.43	0.12
THC-B	Interconnecting Duct THC	ppm	10.98	100.00	17.81	18.52	14.19	100.00	84.15	12.60	25.88	100.00	78.45	6.82	10.01	25.88	11.87	1.76
CO	Stack's CO	ppm	0.00	98.50	8.79	20.71	0.00	0.50	0.00	0.05	0.00	0.50	0.00	0.04	0.00	0.50	0.00	0.04
THC	Stack's THC	ppm	-2.66	-2.13	-2.43	0.20	-2.9	-2.06	-2.22	0.17	-2.12	-2.01	-2.06	0.02	-2.49	-2.04	-2.29	0.09
NOx	Stack's NOx	ppm	3.40	67.73	44.44	22.00	42.55	95.98	50.52	5.28	43.38	59.13	49.89	3.58	47.26	56.95	50.35	2.15
SO2	Stack SO2	ppm	1.50	1.50	1.50	0.00	0.50	1.50	1.04	0.16	0.50	1.00	1.00	0.03	1.00	1.50	1.03	0.13
O2	Stack's O2	%	9.65	18.48	12.30	3.14	9.48	11.38	10.44	0.25	9.98	11.53	10.72	0.35	11.23	12.28	11.61	0.18
CO2	Stack's CO2	%	0.16	4.82	3.42	1.65	3.98	4.90	4.39	0.12	3.88	4.64	4.28	0.17	3.50	4.0	3.86	0.10
TIT-300	Ambient Temp	Deg. F	78.08	81.50	79.71	0.72	77.90	82.40	79.74	1.16	75.56	79.52	77.40	0.98	73.58	76.8	75.36	0.79



SUMMARY OF DATA

Date:	27-Feb-96
Time:	15:00
Test Number:	13
Soak Time:	1 Hrs.
Soak Temp:	Greater than 500 F

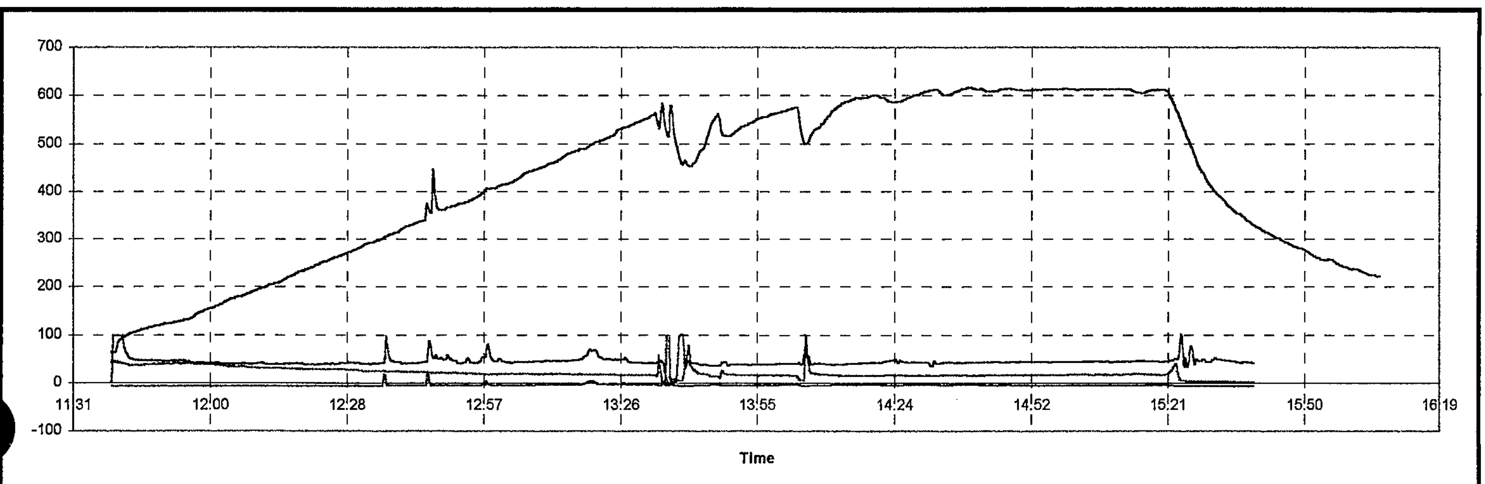
Tag	Parameter Description	Unit	8:04	WARM		8:28	8:28	RAMP		10:50	10:50	SOAK		11:54	11:54	COOL		13:03
			Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	4.06	11.50	4.21	0.75	4.09	11.87	9.85	1.72	4.30	11.38	10.93	0.45	2.68	11.18	4.12	1.99
FIT-231	Fuel Gas Flow	CFH	-1.38	133.60	2.09	19.66	-1.40	161.68	83.51	38.51	-1.55	149.85	116.18	15.27	-1.75	151.93	6.35	21.55
PIT-222	Combustion Air Pressure	In.WC	21.54	23.25	21.64	0.17	20.85	23.43	23.19	0.44	22.05	23.38	23.29	0.08	21.37	23.30	21.81	0.46
FIT-221	Combustion Air Flow	CFH	10628	12788	12720	214	9913	13464	10430	661	9891	11775	10026	120	9945	12188	11794	509
PIT-158	Chamber Pressure (Draft)	In.WC	-0.37	-0.26	-0.31	0.02	-0.57	-0.15	-0.25	0.04	-0.26	-0.17	-0.21	0.01	-1.00	-0.1	-0.53	0.20
TIT-201	Recorder Temperature	Deg.F	68.63	79.28	69.12	1.07	75.68	561.75	317.23	139.63	531.38	576.38	553.80	10.88	145.43	531.38	254.00	100.27
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	68.78	78.60	69.23	0.99	76.05	566.18	319.71	140.74	534.90	580.43	557.10	11.34	144.90	534.90	252.59	100.58
TIT-203	Material Thermocouple #1	Deg.F	69.60	77.55	70.19	0.77	77.55	1028.6	328.34	154.67	525.08	594.53	562.17	17.13	127.05	525.08	244.95	111.29
TIT-204	Material Thermocouple #2	Deg.F	69.00	70.35	69.22	0.17	70.35	392.63	225.26	93.77	392.63	430.05	415.44	8.73	182.70	427.80	260.00	70.25
TIT-205	Material Thermocouple #3	Deg.F	69.68	71.10	70.09	0.18	71.10	431.78	227.82	106.73	431.78	514.13	490.39	22.51	216.30	513.45	345.04	90.79
TIT-206	Material Thermocouple #4	Deg.F	69.45	77.78	70.00	0.81	75.83	473.18	264.07	115.44	464.70	493.73	479.96	5.96	144.75	464.70	247.08	89.63
TIT-207	Material Thermocouple #5	Deg.F	70.13	80.70	70.47	1.05	76.58	626.25	353.03	155.12	574.88	636.83	607.84	13.72	155.25	574.88	279.58	109.21
[illegible]																		
[illegible]-131	Combustor Burner Temp. Control	Deg. F	66	1787	1446	524	1777	1836	1808	13	-463	1850	663	1150	-463	-462	-462	0
[illegible]-149	Fumes Flow	PPH	2211	2399	2276	46	2124	2460	2197	53	2150	2287	2199	17	1691	3714	3193	433
[illegible]-151	Fumes Pressure	InWC	0.42	0.58	0.46	0.04	0.29	0.63	0.36	0.06	0.28	0.33	0.31	0.01	0.07	1.77	1.26	0.44
[illegible]-145	Combustor Temperature	Deg. F	68	1805	1474	521	1786	1852	1821	14	-500	1904	1794	205	1034	1912	1572	297
[illegible]-135	Fuel Pressure	PSIG	0.02	0.81	0.74	0.21	0.31	0.80	0.54	0.11	0.00	0.63	0.39	0.06	0.00	0.81	0.57	0.28
[illegible]-121	Fuel Gas Flow	CFH	125	1105	1028	251	552	1102	803	134	1	883	613	62	1	1101	838	341
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-0.45	-0.23	-0.37	0.04	-0.33	27.00	1.44	2.81	2.93	9.33	3.47	0.87	2.70	3.90	2.98	0.25
THC-B	Interconnecting Duct THC	ppm	-1.57	100.00	3.11	20.09	3.08	100.00	50.94	19.83	27.29	45.83	36.86	4.56	-1.07	100.00	11.36	26.71
CO	Stack's CO	ppm	0.00	170.50	9.96	35.68	-0.50	0.50	0.02	0.11	0.00	0.50	0.00	0.03	0.00	321.50	35.60	58.66
THC	Stack's THC	ppm	1.73	62.44	3.71	8.37	1.7	2.57	1.73	0.05	1.71	2.11	1.76	0.04	0.88	38.26	3.21	5.36
NOx	Stack's NOx	ppm	-0.98	54.48	45.44	15.13	43.25	102.28	53.12	10.77	49.70	73.85	53.03	4.57	3.80	96.83	36.41	22.31
SO2	Stack SO2	ppm	1.00	1.50	1.18	0.24	1.00	2.50	1.33	0.38	1.50	2.50	2.06	0.29	2.00	3.00	2.42	0.26
O2	Stack's O2	%	10.25	18.45	11.24	2.29	8.50	10.68	10.00	0.38	8.20	11.88	10.03	0.35	7.98	18.18	12.90	2.23
CO2	Stack's CO2	%	0.12	5.90	5.25	1.61	5.62	7.00	6.05	0.25	4.56	7.22	5.93	0.25	0.18	7.4	3.76	1.62
TIT-300	Ambient Temp	Deg. F	62.42	63.50	62.94	0.21	63.14	70.88	66.21	1.82	68.54	69.98	69.09	0.37	69.26	622.6	74.37	33.11



SUMMARY OF DATA

Date: 28-Feb-96		Test Number:	14
Time: 17:19		Soak Time:	1 Hrs.
		Soak Temp:	Greater than 600 F

			11:39	WARM		11:40	11:40	RAMP		14:18	14:18	SOAK		15:21	15:21	COOL		15:54
Tag	**Parameter Description**	**Unit**	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.65	11.04	7.66	1.86	3.81	13.16	10.61	1.48	3.84	11.95	11.42	1.18	3.30	11.54	6.47	3.70
FIT-231	Fuel Gas Flow	CFH	-1.60	146.20	44.33	33.32	-1.40	400.00	110.39	51.96	-1.40	178.55	143.95	27.92	-1.18	130.43	44.33	60.40
PIT-222	Combustion Air Pressure	In.WC	22.16	23.57	22.99	0.38	22.39	23.91	23.57	0.26	22.46	24.05	23.89	0.22	22.50	24.09	23.11	0.69
FIT-221	Combustion Air Flow	CFH	10147	12070	11028	491	9919	12097	10241	390	9972	12106	10106	307	10109	12278	11462	989
PIT-158	Chamber Pressure (Draft)	In.WC	-0.39	-0.15	-0.31	0.05	-0.43	-0.08	-0.25	0.05	-0.45	-0.21	-0.36	0.05	-0.97	-0.3	-0.44	0.10
TIT-201	Recorder Temperature	Deg.F	64.65	131.03	104.48	23.17	131.03	672.45	414.84	159.84	515.78	682.28	652.52	33.32	189.75	668.78	430.81	191.24
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	65.10	132.53	105.60	23.59	132.53	677.63	418.35	161.10	515.93	687.38	657.14	33.89	188.93	672.75	431.06	193.84
TIT-203	Material Thermocouple #1	Deg.F	66.30	119.85	99.06	18.40	119.85	646.0	385.23	154.41	546.90	657.75	624.75	30.22	150.15	651.30	408.80	202.79
TIT-204	Material Thermocouple #2	Deg.F	65.33	98.33	84.13	12.30	98.33	408.60	261.24	97.10	395.25	497.85	458.57	28.91	241.73	512.55	389.16	102.58
TIT-205	Material Thermocouple #3	Deg.F	65.25	75.53	69.27	3.38	75.53	540.23	308.62	152.64	532.58	629.03	591.90	30.22	275.18	632.85	497.61	131.62
TIT-206	Material Thermocouple #4	Deg.F	65.33	116.48	99.96	17.90	116.48	588.98	343.82	134.51	413.55	594.30	557.34	34.92	134.10	582.90	345.51	185.92
TIT-207	Material Thermocouple #5	Deg.F	66.53	143.33	116.19	27.66	143.33	923.70	457.77	177.60	543.30	741.60	703.15	33.79	202.50	711.08	455.20	203.08
AFTERBURNER																		
TE-131	Combustor Burner Temp. Control	Deg. F	-463	-462	-462	0	-463	-462	-462	0	-463	-462	-462	0	-463	-462	-462	0
FIT-149	Fumes Flow	PPH	2301	2412	2341	25	2069	2713	2238	97	2100	2705	2204	94	2081	3411	2753	510
PIT-151	Fumes Pressure	InWC	0.47	0.59	0.52	0.03	0.22	0.69	0.37	0.08	0.25	0.72	0.33	0.06	0.27	1.54	0.88	0.48
TIT-145	Combustor Temperature	Deg. F	1811	1853	1832	14	1282	1873	1831	69	1801	1874	1833	15	1786	1907	1829	15
PIT-133	Fuel Pressure	PSIG	0.71	0.78	0.74	0.03	0.00	0.82	0.51	0.13	0.29	0.53	0.38	0.05	0.33	0.83	0.62	0.23
FIT-421	Fuel Gas Flow	CFH	1007	1078	1041	32	1	1097	765	167	493	781	601	45	547	1099	866	250
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	-5.65	-5.33	-5.46	0.09	-5.48	23.08	-3.93	2.55	-5.35	-3.15	-3.69	0.34	-5.98	-3.48	-5.13	0.97
THC-B	Interconnecting Duct THC	ppm	2.18	100.00	70.45	27.21	3.84	100.00	26.28	11.43	5.44	100.00	17.18	6.81	2.44	40.31	8.80	8.02
CO	Stack's CO	ppm	-0.50	0.50	0.00	0.15	-0.50	497.00	5.71	47.75	-0.50	0.50	0.04	0.15	0.00	0.50	0.06	0.16
THC	Stack's THC	ppm	-0.72	-0.14	-0.68	0.12	-0.8	100.00	-0.04	6.76	-0.77	0.24	-0.71	0.07	-0.78	-0.43	-0.73	0.03
NOx	Stack's NOx	ppm	36.70	45.85	40.86	2.91	-0.58	102.10	44.57	10.77	36.05	60.30	42.76	3.27	34.33	102.55	44.84	5.89
SO2	Stack SO2	ppm	2.00	2.50	2.02	0.10	2.00	2.50	2.02	0.10	1.50	2.50	2.00	0.05	2.00	2.50	2.16	0.23
O2	Stack's O2	%	10.90	12.05	11.58	0.28	8.98	18.83	11.01	1.06	10.10	13.50	10.82	0.48	10.88	14.83	12.31	1.00
CO2	Stack's CO2	%	5.46	6.18	5.76	0.19	1.08	7.06	6.10	0.69	4.48	6.68	6.24	0.30	3.68	6.2	5.26	0.69
TIT-300	Ambient Temp	Deg. F	59.72	61.52	60.34	0.44	57.74	63.14	60.41	1.26	55.40	60.44	57.43	0.95	52.70	55.8	54.32	0.76

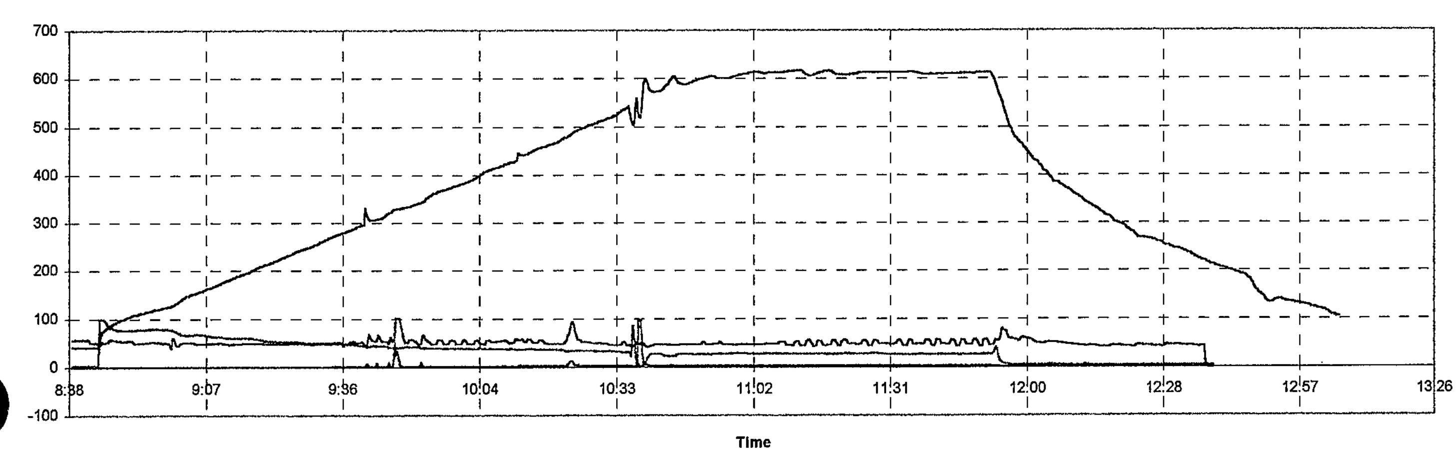


SUMMARY OF DATA

Date: 1-Mar-96
Time: 15:00

Test Number: 15
Soak Time: 1 Hrs.
Soak Temp: Greater than 600 F

			8:39	WARM		8:44	8:44	RAMP		10:51	10:51	SOAK		11:52	11:52	COOL		13:14
Tag	**Parameter Description**	**Unit**	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.	Min.	Max.	Ave.	Std.
FURNACE																		
PIT-232	Fuel Gas Pressure	In.WC	3.90	11.02	4.46	1.73	4.54	13.69	11.46	1.15	10.92	12.49	12.13	0.19	3.70	10.92	7.76	1.58
FIT-231	Fuel Gas Flow	CFH	-0.58	108.08	5.97	23.79	-0.60	400.00	116.48	52.14	79.63	174.55	145.15	13.12	-0.90	79.63	-0.38	5.30
PIT-222	Combustion Air Pressure	In.WC	23.50	24.92	23.63	0.34	23.43	24.95	24.82	0.15	24.50	24.92	24.74	0.09	18.11	24.50	19.06	1.73
FIT-221	Combustion Air Flow	CFH	10569	12467	12308	450	10066	12177	10426	322	10123	10452	10173	30	10452	16663	15896	1528
PIT-158	Chamber Pressure (Draft)	In.WC	-0.45	-0.21	-0.33	0.05	-0.52	-0.12	-0.23	0.03	-0.24	-0.20	-0.21	0.01	-0.76	0.0	-0.30	0.25
TIT-201	Recorder Temperature	Deg.F	41.63	62.55	42.73	4.27	62.55	711.38	401.35	179.30	644.70	683.70	667.24	8.38	73.73	644.70	224.45	121.83
TIT-202	Furnace Exit Gas Temp (Control)	Deg.F	41.70	62.78	42.93	4.27	62.78	719.70	406.53	182.53	651.60	694.05	675.81	9.46	73.20	651.60	223.22	121.17
TIT-203	Material Thermocouple #1	Deg.F	42.60	62.33	43.77	4.00	62.33	673.7	369.50	170.80	603.00	652.20	631.74	10.88	69.45	615.75	254.33	146.02
TIT-204	Material Thermocouple #2	Deg.F	42.00	46.95	42.43	0.97	46.95	536.03	284.71	129.66	536.03	568.73	555.22	7.80	66.08	558.23	270.24	104.37
TIT-205	Material Thermocouple #3	Deg.F	42.45	47.25	42.78	0.96	47.25	514.73	258.87	132.68	514.73	615.75	585.65	28.37	65.55	615.23	312.97	149.60
TIT-206	Material Thermocouple #4	Deg.F	42.23	66.38	43.61	4.95	66.38	579.23	328.70	152.05	559.13	587.25	575.23	6.96	63.90	559.13	216.88	116.35
TIT-207	Material Thermocouple #5	Deg.F	42.83	70.43	44.22	5.61	70.43	830.40	437.30	194.14	674.55	735.08	710.59	11.86	64.80	674.55	213.05	129.13
AFTERBURNER																		
TIT-131	Combustor Burner Temp. Control	Deg. F	1797	1828	1817	11	1797	1850	1835	11	1807	1850	1833	13	181	1850	1203	690
FIT-149	Fumes Flow	PPH	2165	2384	2243	68	2001	2501	2126	66	2163	2238	2194	14	2188	4000	3580	404
PIT-151	Fumes Pressure	InWC	0.44	0.60	0.51	0.06	0.28	0.57	0.34	0.03	0.32	0.35	0.33	0.01	0.35	2.47	1.76	0.50
TIT-145	Combustor Temperature	Deg. F	1802	1836	1823	12	1802	1882	1840	14	1808	1875	1839	17	152	1879	1183	711
PIT-133	Fuel Pressure	PSIG	0.82	0.84	0.82	0.01	0.42	0.84	0.53	0.10	0.30	0.45	0.36	0.03	0.00	0.85	0.44	0.40
FIT-121	Fuel Gas Flow	CFH	1091	1100	1092	3	606	1100	758	119	479	656	581	49	1	1097	569	530
CEM																		
NOx-B	Interconnecting Duct NOx	ppm	1.13	1.20	1.15	0.02	1.15	51.08	2.85	3.40	2.78	3.83	3.20	0.22	1.00	2.78	1.11	0.17
THC-B	Interconnecting Duct THC	ppm	3.47	100.00	7.64	19.67	5.94	100.00	48.25	17.69	25.29	31.96	27.35	0.84	3.14	42.72	4.32	3.72
CO	Stack's CO	ppm	0.00	0.00	0.00	0.00	-0.50	0.50	-0.01	0.11	-0.50	0.50	-0.02	0.18	-0.50	24.50	0.51	1.86
THC	Stack's THC	ppm	-0.16	-0.02	-0.11	0.03	-0.3	0.06	-0.20	0.04	-0.27	0.14	-0.23	0.04	-0.24	29.42	0.72	2.45
NOx	Stack's NOx	ppm	50.75	58.08	55.18	3.08	40.08	102.50	52.24	7.35	43.25	58.18	49.81	3.89	-0.98	81.23	26.30	25.26
SO2	Stack SO2	ppm	1.50	2.00	1.54	0.14	1.50	2.00	1.85	0.23	1.50	2.50	2.01	0.09	1.50	2.50	2.00	0.08
O2	Stack's O2	%	10.33	10.80	10.49	0.20	6.60	11.18	9.59	0.51	8.43	10.88	9.71	0.49	9.90	18.40	14.77	3.21
CO2	Stack's CO2	%	5.50	5.86	5.73	0.15	5.16	8.66	6.35	0.35	5.40	7.16	6.24	0.35	0.06	6.1	2.59	2.27
TIT-300	Ambient Temp	Deg. F	37.40	37.94	37.77	0.14	37.76	44.06	39.74	1.23	40.46	44.78	42.35	0.95	41.72	44.8	42.94	0.57



APPENDIX H

SOURCE EMISSIONS DATA SUMMARY SHEETS FOR TEST RUNS 1-3

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF CEM PARAMETERS

Test Run No.	Test Date	Test Period	Furnace Outlet Duct				Afterburner Discharge Stack					
			NO_x		THC [1]		NO_x		THC [1]		SO_2	
			Concentration (ppm/v)	Mass[2] Rate (lb/hr)	Concentration (ppm/v)	Mass[2] Rate (lb/hr)	Concentration (ppm/v)	Mass[2] Rate (lb/hr)	Concentration (ppm/v)	Mass[2] Rate (lb/hr)	Concentration (ppm/v)	Mass[2] Rate (lb/hr)
T1	1/31/96 - 2/1/96	1831-0122	<1.0	$<4.9x10^{-3}$	12.6	0.059	35.4	0.27	<1	$<7.2x10^{-3}$	<1	<0.01
T2	2/2/96	1404-2043	1.9	$7.8x10^{-3}$	50.7	0.19	59.6	0.44	<1	$<6.8x10^{-3}$	<1	<0.01
T3	2/4/96	1408-2049	4.2	$1.6x10^{-2}$	79.7	0.29	63.3	0.43	1.3	$8.6x10^{-3}$	1.0	0.009

(1) Total hydrocarbon concentrations and mass rates are calculated on a dry basis (as propane).

(2) Mass rates calculated using volumetric airflows measured on the isokinetic sampling trains.

	Overall Hot Gas System Removal Efficiency [1]			Afterburner Removal Efficiency [2]		
	Test Run #1	Test Run #2	Test Run #3	Test Run 1	Test Run 2	Test Run 3
Date	31 Jan 96	2 Feb 96	4 Feb 96	31 Jan 96	2 Feb 96	4 Feb 96
Time				1832-0122	1405-2100	1406-2036
Explosive Removal Efficiency (%)						
2,4,6 - Trinitrotoluene (TNT)	>99.997	>99.95	>99.94	>99.97	>99.86	>99.86
Tetryl	>99.79	>99.92	>99.94	>84.91	>79.09	>67.15
RDX	>99.88	>99.97	>99.91	>98.30	>99.00	>97.68

(1) Based on total explosives introduced to furnace converted to lb/hr (using total test times) and afterburner discharge mass rate determination for each explosive.

(2) Afterburner removal efficiency based on the following: $\% \ RE = \frac{AFT\ IN - AFT\ OUT}{AFT\ IN} \times 100$

NOTES: All removal efficiencies reported as greater than since no explosives were measured above the method detection limit at the afterburner discharge.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA					
Run number		T1		T2	FIELD BLANK [1]
Location		AFTERBURNER DISCHARGE			
Date		01-31-96		02-02-96	02-04-96
Time period		1834-0110		1406-2031	
SEMI-VOLATILE ORGANICS LABORATORY REPORT DATA, ug					
Phenol		4.36		8.01	9.08
Bis (2-chloroethyl) ether	ND<	4.00	ND<	3.81	
2-Chlorophenol	ND<	2.40	ND<	2.29	
1,3-Dichlorobenzene	ND<	2.04	ND<	1.94	
1,4-Dichlorobenzene	ND<	1.95	ND<	1.86	
Benzyl Alcohol		378.52		1521.61	2515.21
1,2-Dichlorobenzene	ND<	2.09	ND<	1.99	
2-Methylphenol	ND<	3.82	ND<	3.64	
bis (2-Chloroisopropyl) ether	ND<	4.11	ND<	3.92	
4-Methylphenol	ND<	3.76	ND<	3.59	
n-Nitroso-di-n-propylamine	ND<	5.05	ND<	4.82	
Hexachloroethane	ND<	4.09	ND<	3.89	
Nitrobenzene	ND<	2.53	ND<	2.52	
Isophorone	ND<	1.42	ND<	1.42	
2-Nitrophenol	ND<	3.70	ND<	3.68	
2,4-Dimethylphenol	ND<	3.12	ND<	3.10	
Benzoic acid		50.02		66.93	48.28
Bis (2-chloroethoxy)-methane	ND<	3.16	ND<	3.14	
2,4-Dichlorophenol	ND<	2.66	ND<	2.64	
1,2,4-Trichlorobenzene	ND<	2.16	ND<	2.15	
Naphthalene		1.34		1.63	1.64
4-Chloroanaline	ND<	2.05	ND<	2.04	
Hexachlorobutadiene	ND<	2.60	ND<	2.59	
4-chloro-3-methylphenol	ND<	3.25	ND<	3.23	
2-Methylnaphthalene	ND<	1.26	ND<	1.25	
Hexachlorocyclopentadiene	ND<	2.34	ND<	2.30	
2,4,6-Trichlorophenol	ND<	2.92	ND<	2.87	
2,4,5-Trichlorophenol	ND<	2.82	ND<	2.78	
2-Chloronaphthalene	ND<	1.17	ND<	1.15	
2-Nitroaniline	ND<	4.32	ND<	4.25	
Dimethylphthalate	ND<	0.96	ND<	0.95	
Acenaphthylene	ND<	0.75	ND<	0.74	
2,6-Dinitrotoluene	ND<	4.13	ND<	4.07	
3-Nitroaniline	ND<	3.76	ND<	3.69	
Acenaphthene	ND<	1.34	ND<	1.32	
2,4-Dinitrophenol	ND<	8.53	ND<	8.39	
4-Nitrophenol	ND<	4.05	ND<	3.99	
Dibenzofuran	ND<	0.78	ND<	0.77	
2,4-Dinitrotoluene	ND<	2.69	ND<	2.65	
Diethylpthalate		7.80		3.61	1.29
4-Chlorophenyl-phenyl ether	ND<	1.86	ND<	1.83	
Fluorene	ND<	1.02	ND<	1.00	
4-Nitroaniline	ND<	3.68	ND<	3.62	
4,6-Dinitro-2-methylphenol	ND<	4.65	ND<	4.44	
n-Nitrosodiphenylamine	ND<	1.50	ND<	1.43	
4-Bromophenyl-phenyl ether	ND<	2.15	ND<	2.06	
Hexachlorobenzene	ND<	1.54	ND<	1.47	
Pentachlorophenol	ND<	2.69	ND<	2.57	
Phenanthrene	ND<	0.59	ND<	0.56	
Anthracene		0.35	ND<	0.57	
Di-n-butylphthalate		21.48		15.26	8.30
Fluoranthene	ND<	0.45	ND<	0.43	
Pyrene	ND<	0.33	ND<	0.30	
Butylbenzylphthalate		0.39	ND<	0.53	
3,3'-Dichlorobenzidine	ND<	0.94	ND<	0.85	
Benzo(a)anthracene	ND<	0.35	ND<	0.32	
Chrysene	ND<	0.38	ND<	0.34	
bis(2-Ethylhexyl)phthalate		16.27		18.01	4.49
Di-n-octylphthalate	ND<	0.25	ND<	0.28	
Benzo(b)fluoranthene	ND<	0.34	ND<	0.39	
Benzo(k)fluoranthene	ND<	0.35	ND<	0.40	
Benzo(a)pyrene	ND<	0.35	ND<	0.40	
Indeno(1,2,3-cd)pyrene	ND<	0.36	ND<	0.40	
Dibenzo(a,h)anthracene	ND<	0.48	ND<	0.53	
Benzo(g,h,i)perylene	ND<	0.42	ND<	0.47	

(1) Detected values only; all other compounds ND<.
Note: Data not available for test T3.
"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA				
Run number		T1		T2
Location	AFTERBURNER DISCHARGE			
Date		01-31-96		02-02-96
Time period		1834-0110		1406-2031
SEMIVOLATILE ORGANICS CONCENTRATIONS, ug/dscm				
Phenol		0.85		1.58
Bis (2-chloroethyl) ether	ND<	0.78	ND<	0.75
2-Chlorophenol	ND<	0.47	ND<	0.45
1,3-Dichlorobenzene	ND<	0.40	ND<	0.38
1,4-Dichlorobenzene	ND<	0.38	ND<	0.37
Benzyl Alcohol		73.49		300.72
1,2-Dichlorobenzene	ND<	0.41	ND<	0.39
2-Methylphenol	ND<	0.74	ND<	0.72
bis (2-Chloroisopropyl) ether	ND<	0.80	ND<	0.77
4-Methylphenol	ND<	0.73	ND<	0.71
n-Nitroso-di-n-propylamine	ND<	0.98	ND<	0.95
Hexachloroethane	ND<	0.79	ND<	0.77
Nitrobenzene	ND<	0.49	ND<	0.50
Isophorone	ND<	0.28	ND<	0.28
2-Nitrophenol	ND<	0.72	ND<	0.73
2,4-Dimethylphenol	ND<	0.61	ND<	0.61
Benzoic acid		9.71		13.23
Bis (2-chloroethoxy)-methane	ND<	0.61	ND<	0.62
2,4-Dichlorophenol	ND<	0.52	ND<	0.52
1,2,4-Trichlorobenzene	ND<	0.42	ND<	0.42
Naphthalene		0.26		0.32
4-Chloroanaline	ND<	0.40	ND<	0.40
Hexachlorobutadiene	ND<	0.50	ND<	0.51
4-chloro-3-methylphenol	ND<	0.63	ND<	0.64
2-Methylnaphthalene	ND<	0.24	ND<	0.25
Hexachlorocyclopentadiene	ND<	0.45	ND<	0.45
2,4,6-Trichlorophenol	ND<	0.57	ND<	0.57
2,4,5-Trichlorophenol	ND<	0.55	ND<	0.55
2-Chloronaphthalene	ND<	0.23	ND<	0.23
2-Nitroaniline	ND<	0.84	ND<	0.84
Dimethylphthalate	ND<	0.19	ND<	0.19
Acenaphthylene	ND<	0.15	ND<	0.15
2,6-Dinitrotoluene	ND<	0.80	ND<	0.80
3-Nitroaniline	ND<	0.73	ND<	0.73
Acenaphthene	ND<	0.26	ND<	0.26
2,4-Dinitrophenol	ND<	1.66	ND<	1.66
4-Nitrophenol	ND<	0.79	ND<	0.79
Dibenzofuran	ND<	0.15	ND<	0.15
2,4-Dinitrotoluene	ND<	0.52	ND<	0.52
Diethylpthalate		1.51		0.71
4-Chlorophenyl-phenyl ether	ND<	0.36	ND<	0.36
Fluorene	ND<	0.20	ND<	0.20
4-Nitroaniline	ND<	0.71	ND<	0.72
4,6-Dinitro-2-methylphenol	ND<	0.90	ND<	0.88
n-Nitrosodiphenylamine	ND<	0.29	ND<	0.28
4-Bromophenyl-phenyl ether	ND<	0.42	ND<	0.41
Hexachlorobenzene	ND<	0.30	ND<	0.29
Pentachlorophenol	ND<	0.52	ND<	0.51
Phenanthrene	ND<	0.11	ND<	0.11
Anthracene		0.07	ND<	0.11
Di-n-butylphthalate		4.17		3.02
Fluoranthene	ND<	0.09	ND<	0.08
Pyrene	ND<	0.06	ND<	0.06
Butylbenzylphthalate		0.08	ND<	0.10
3,3'-Dichlorobenzidine	ND<	0.18	ND<	0.17
Benzo(a)anthracene	ND<	0.07	ND<	0.06
Chrysene	ND<	0.07	ND<	0.07
bis(2-Ethylhexyl)phthalate		3.16		3.56
Di-n-octylphthalate	ND<	0.05	ND<	0.06
Benzo(b)fluoranthene	ND<	0.07	ND<	0.08
Benzo(k)fluoranthene	ND<	0.07	ND<	0.08
Benzo(a)pyrene	ND<	0.07	ND<	0.08
Indeno(1,2,3-cd)pyrene	ND<	0.07	ND<	0.08
Dibenzo(a,h)anthracene	ND<	0.09	ND<	0.10
Benzo(g,h,i)perylene	ND<	0.08	ND<	0.09

"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA		
Run number	T1	T2
Location	AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96
Time period	1834-0110	1406-2031
SEMIVOLATILE ORGANICS CONCENTRATIONS, lb/dscf		
Phenol	5.29E-11	9.88E-11
Bis (2-chloroethyl) ether	ND< 4.85E-11	ND< 4.70E-11
2-Chlorophenol	ND< 2.91E-11	ND< 2.83E-11
1,3-Dichlorobenzene	ND< 2.47E-11	ND< 2.39E-11
1,4-Dichlorobenzene	ND< 2.36E-11	ND< 2.30E-11
Benzyl Alcohol	4.59E-09	1.88E-08
1,2-Dichlorobenzene	ND< 2.53E-11	ND< 2.46E-11
2-Methylphenol	ND< 4.63E-11	ND< 4.49E-11
bis (2-Chloroisopropyl) ether	ND< 4.98E-11	ND< 4.84E-11
4-Methylphenol	ND< 4.56E-11	ND< 4.43E-11
n-Nitroso-di-n-propylamine	ND< 6.12E-11	ND< 5.95E-11
Hexachloroethane	ND< 4.96E-11	ND< 4.80E-11
Nitrobenzene	ND< 3.07E-11	ND< 3.11E-11
Isophorone	ND< 1.72E-11	ND< 1.75E-11
2-Nitrophenol	ND< 4.49E-11	ND< 4.54E-11
2,4-Dimethylphenol	ND< 3.78E-11	ND< 3.83E-11
Benzoic acid	6.06E-10	8.26E-10
Bis (2-chloroethoxy)-methane	ND< 3.83E-11	ND< 3.87E-11
2,4-Dichlorophenol	ND< 3.22E-11	ND< 3.26E-11
1,2,4-Trichlorobenzene	ND< 2.62E-11	ND< 2.65E-11
Naphthalene	1.62E-11	2.01E-11
4-Chloroanaline	ND< 2.49E-11	ND< 2.52E-11
Hexachlorobutadiene	ND< 3.15E-11	ND< 3.20E-11
4-chloro-3-methylphenol	ND< 3.94E-11	ND< 3.99E-11
2-Methylnaphthalene	ND< 1.53E-11	ND< 1.54E-11
Hexachlorocyclopentadiene	ND< 2.84E-11	ND< 2.84E-11
2,4,6-Trichlorophenol	ND< 3.54E-11	ND< 3.54E-11
2,4,5-Trichlorophenol	ND< 3.42E-11	ND< 3.43E-11
2-Chloronaphthalene	ND< 1.42E-11	ND< 1.42E-11
2-Nitroaniline	ND< 5.24E-11	ND< 5.24E-11
Dimethylphthalate	ND< 1.16E-11	ND< 1.17E-11
Acenaphthylene	ND< 9.09E-12	ND< 9.13E-12
2,6-Dinitrotoluene	ND< 5.01E-11	ND< 5.02E-11
3-Nitroaniline	ND< 4.56E-11	ND< 4.55E-11
Acenaphthene	ND< 1.62E-11	ND< 1.63E-11
2,4-Dinitrophenol	ND< 1.03E-10	ND< 1.04E-10
4-Nitrophenol	ND< 4.91E-11	ND< 4.92E-11
Dibenzofuran	ND< 9.46E-12	ND< 9.50E-12
2,4-Dinitrotoluene	ND< 3.26E-11	ND< 3.27E-11
Diethylpthalate	9.46E-11	4.45E-11
4-Chlorophenyl-phenyl ether	ND< 2.25E-11	ND< 2.26E-11
Fluorene	ND< 1.24E-11	ND< 1.23E-11
4-Nitroaniline	ND< 4.46E-11	ND< 4.47E-11
4,6-Dinitro-2-methylphenol	ND< 5.64E-11	ND< 5.48E-11
n-Nitrosodiphenylamine	ND< 1.82E-11	ND< 1.76E-11
4-Bromophenyl-phenyl ether	ND< 2.61E-11	ND< 2.54E-11
Hexachlorobenzene	ND< 1.87E-11	ND< 1.81E-11
Pentachlorophenol	ND< 3.26E-11	ND< 3.17E-11
Phenanthrene	ND< 7.15E-12	ND< 6.91E-12
Anthracene	4.24E-12	ND< 7.03E-12
Di-n-butylphthalate	2.60E-10	1.88E-10
Fluoranthene	ND< 5.46E-12	ND< 5.31E-12
Pyrene	ND< 4.00E-12	ND< 3.70E-12
Butylbenzylphthalate	4.73E-12	ND< 6.54E-12
3,3'-Dichlorobenzidine	ND< 1.14E-11	ND< 1.05E-11
Benzo(a)anthracene	ND< 4.24E-12	ND< 3.95E-12
Chrysene	ND< 4.61E-12	ND< 4.20E-12
bis(2-Ethylhexyl)phthalate	1.97E-10	2.22E-10
Di-n-octylphthalate	ND< 3.03E-12	ND< 3.45E-12
Benzo(b)fluoranthene	ND< 4.12E-12	ND< 4.81E-12
Benzo(k)fluoranthene	ND< 4.24E-12	ND< 4.94E-12
Benzo(a)pyrene	ND< 4.24E-12	ND< 4.94E-12
Indeno(1,2,3-cd)pyrene	ND< 4.36E-12	ND< 4.94E-12
Dibenzo(a,h)anthracene	ND< 5.82E-12	ND< 6.54E-12
Benzo(g,h,i)perylene	ND< 5.09E-12	ND< 5.80E-12

"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA				
Run number		T1		T2
Location		AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96
Time period		1834-0110		1406-2031
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/hr				
Phenol		3.50E-06		6.29E-06
Bis (2-chloroethyl) ether	ND<	3.21E-06	ND<	2.99E-06
2-Chlorophenol	ND<	1.93E-06	ND<	1.80E-06
1,3-Dichlorobenzene	ND<	1.64E-06	ND<	1.52E-06
1,4-Dichlorobenzene	ND<	1.57E-06	ND<	1.46E-06
Benzyl Alcohol		3.04E-04		1.19E-03
1,2-Dichlorobenzene	ND<	1.68E-06	ND<	1.56E-06
2-Methylphenol	ND<	3.07E-06	ND<	2.86E-06
bis (2-Chloroisopropyl) ether	ND<	3.30E-06	ND<	3.08E-06
4-Methylphenol	ND<	3.02E-06	ND<	2.82E-06
n-Nitroso-di-n-propylamine	ND<	4.05E-06	ND<	3.78E-06
Hexachloroethane	ND<	3.28E-06	ND<	3.05E-06
Nitrobenzene	ND<	2.03E-06	ND<	1.98E-06
Isophorone	ND<	1.14E-06	ND<	1.11E-06
2-Nitrophenol	ND<	2.97E-06	ND<	2.89E-06
2,4-Dimethylphenol	ND<	2.50E-06	ND<	2.43E-06
Benzoic acid		4.01E-05		5.25E-05
Bis (2-chloroethoxy)-methane	ND<	2.54E-06	ND<	2.47E-06
2,4-Dichlorophenol	ND<	2.13E-06	ND<	2.07E-06
1,2,4-Trichlorobenzene	ND<	1.73E-06	ND<	1.69E-06
Naphthalene		1.08E-06		1.28E-06
4-Chloroanaline	ND<	1.65E-06	ND<	1.60E-06
Hexachlorobutadiene	ND<	2.09E-06	ND<	2.03E-06
4-chloro-3-methylphenol	ND<	2.61E-06	ND<	2.54E-06
2-Methylnaphthalene	ND<	1.01E-06	ND<	9.81E-07
Hexachlorocyclopentadiene	ND<	1.88E-06	ND<	1.81E-06
2,4,6-Trichlorophenol	ND<	2.34E-06	ND<	2.25E-06
2,4,5-Trichlorophenol	ND<	2.26E-06	ND<	2.18E-06
2-Chloronaphthalene	ND<	9.39E-07	ND<	9.03E-07
2-Nitroaniline	ND<	3.47E-06	ND<	3.34E-06
Dimethylphthalate	ND<	7.70E-07	ND<	7.46E-07
Acenaphthylene	ND<	6.02E-07	ND<	5.81E-07
2,6-Dinitrotoluene	ND<	3.31E-06	ND<	3.20E-06
3-Nitroaniline	ND<	3.02E-06	ND<	2.90E-06
Acenaphthene	ND<	1.08E-06	ND<	1.04E-06
2,4-Dinitrophenol	ND<	6.85E-06	ND<	6.59E-06
4-Nitrophenol	ND<	3.25E-06	ND<	3.13E-06
Dibenzofuran	ND<	6.26E-07	ND<	6.05E-07
2,4-Dinitrotoluene	ND<	2.16E-06	ND<	2.08E-06
Diethylpthalate		6.26E-06		2.83E-06
4-Chlorophenyl-phenyl ether	ND<	1.49E-06	ND<	1.44E-06
Fluorene	ND<	8.19E-07	ND<	7.85E-07
4-Nitroaniline	ND<	2.95E-06	ND<	2.84E-06
4,6-Dinitro-2-methylphenol	ND<	3.73E-06	ND<	3.49E-06
n-Nitrosodiphenylamine	ND<	1.20E-06	ND<	1.12E-06
4-Bromophenyl-phenyl ether	ND<	1.73E-06	ND<	1.62E-06
Hexachlorobenzene	ND<	1.24E-06	ND<	1.15E-06
Pentachlorophenol	ND<	2.16E-06	ND<	2.02E-06
Phenanthrene	ND<	4.74E-07	ND<	4.40E-07
Anthracene		2.81E-07	ND<	4.48E-07
Di-n-butylphthalate		1.72E-05		1.20E-05
Fluoranthene	ND<	3.61E-07	ND<	3.38E-07
Pyrene	ND<	2.65E-07	ND<	2.36E-07
Butylbenzylphthalate		3.13E-07	ND<	4.16E-07
3,3'-Dichlorobenzidine	ND<	7.54E-07	ND<	6.67E-07
Benzo(a)anthracene	ND<	2.81E-07	ND<	2.51E-07
Chrysene	ND<	3.05E-07	ND<	2.67E-07
bis(2-Ethylhexyl)phthalate		1.31E-05		1.41E-05
Di-n-octylphthalate	ND<	2.01E-07	ND<	2.20E-07
Benzo(b)fluoranthene	ND<	2.73E-07	ND<	3.06E-07
Benzo(k)fluoranthene	ND<	2.81E-07	ND<	3.14E-07
Benzo(a)pyrene	ND<	2.81E-07	ND<	3.14E-07
Indeno(1,2,3-cd)pyrene	ND<	2.89E-07	ND<	3.14E-07
Dibenzo(a,h)anthracene	ND<	3.85E-07	ND<	4.16E-07
Benzo(g,h,i)perylene	ND<	3.37E-07	ND<	3.69E-07

"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA				
Run number		T1		T2
Location		AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96
Time period		1834-0110		1406-2031
SEMIVOLATILE ORGANICS CONCENTRATIONS, ppb/v				
Phenol		0.22		0.40
Bis (2-chloroethyl) ether	ND<	0.13	ND<	0.13
2-Chlorophenol	ND<	0.09	ND<	0.08
1,3-Dichlorobenzene	ND<	0.06	ND<	0.06
1,4-Dichlorobenzene	ND<	0.06	ND<	0.06
Benzyl Alcohol		16.351		66.90
1,2-Dichlorobenzene	ND<	0.07	ND<	0.06
2-Methylphenol	ND<	0.17	ND<	0.16
bis (2-Chloroisopropyl) ether	ND<	0.11	ND<	0.11
4-Methylphenol	ND<	0.16	ND<	0.16
n-Nitroso-di-n-propylamine	ND<	0.18	ND<	0.18
Hexachloroethane	ND<	0.08	ND<	0.08
Nitrobenzene	ND<	0.10	ND<	0.10
Isophorone	ND<	0.05	ND<	0.05
2-Nitrophenol	ND<	0.12	ND<	0.13
2,4-Dimethylphenol	ND<	0.12	ND<	0.12
Benzoic acid		1.91		2.61
Bis (2-chloroethoxy)-methane	ND<	0.09	ND<	0.09
2,4-Dichlorophenol	ND<	0.08	ND<	0.08
1,2,4-Trichlorobenzene	ND<	0.06	ND<	0.06
Naphthalene		0.05		0.060
4-Chloroanaline	ND<	0.08	ND<	0.08
Hexachlorobutadiene	ND<	0.05	ND<	0.05
4-chloro-3-methylphenol	ND<	0.11	ND<	0.11
2-Methylnaphthalene	ND<	0.041	ND<	0.042
Hexachlorocyclopentadiene	ND<	0.04	ND<	0.04
2,4,6-Trichlorophenol	ND<	0.07	ND<	0.07
2,4,5-Trichlorophenol	ND<	0.07	ND<	0.07
2-Chloronaphthalene	ND<	0.03	ND<	0.03
2-Nitroaniline	ND<	0.15	ND<	0.15
Dimethylphthalate	ND<	0.02	ND<	0.02
Acenaphthylene	ND<	0.02	ND<	0.02
2,6-Dinitrotoluene	ND<	0.11	ND<	0.11
3-Nitroaniline	ND<	0.13	ND<	0.13
Acenaphthene	ND<	0.04	ND<	0.04
2,4-Dinitrophenol	ND<	0.22	ND<	0.22
4-Nitrophenol	ND<	0.14	ND<	0.14
Dibenzofuran	ND<	0.02	ND<	0.02
2,4-Dinitrotoluene	ND<	0.07	ND<	0.07
Diethylpthalate		0.164		0.08
4-Chlorophenyl-phenyl ether	ND<	0.04	ND<	0.04
Fluorene	ND<	0.03	ND<	0.03
4-Nitroaniline	ND<	0.12	ND<	0.12
4,6-Dinitro-2-methylphenol	ND<	0.11	ND<	0.11
n-Nitrosodiphenylamine	ND<	0.04	ND<	0.03
4-Bromophenyl-phenyl ether	ND<	0.04	ND<	0.04
Hexachlorobenzene	ND<	0.03	ND<	0.02
Pentachlorophenol	ND<	0.05	ND<	0.05
Phenanthrene	ND<	0.015	ND<	0.01
Anthracene		0.01	ND<	0.02
Di-n-butylphthalate		0.36		0.26
Fluoranthene	ND<	0.010	ND<	0.01
Pyrene	ND<	0.01	ND<	0.01
Butylbenzylphthalate		0.006	ND<	0.008
3,3'-Dichlorobenzidine	ND<	0.02	ND<	0.02
Benzo(a)anthracene	ND<	0.01	ND<	0.01
Chrysene	ND<	0.01	ND<	0.01
bis(2-Ethylhexyl)phthalate		0.19		0.22
Di-n-octylphthalate	ND<	0.00	ND<	0.00
Benzo(b)fluoranthene	ND<	0.01	ND<	0.01
Benzo(k)fluoranthene	ND<	0.01	ND<	0.01
Benzo(a)pyrene	ND<	0.01	ND<	0.01
Indeno(1,2,3-cd)pyrene	ND<	0.01	ND<	0.01
Dibenzo(a,h)anthracene	ND<	0.01	ND<	0.01
Benzo(g,h,i)perylene	ND<	0.01	ND<	0.01

"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA				
Run number		T1		T2
Location		AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96
Time period		1834-0110		1406-2031
SEMIVOLATILE ORGANICS EMISSION RESULTS, g/sec				
Phenol		4.41E-07		7.92E-07
Bis (2-chloroethyl) ether	ND<	4.04E-07	ND<	3.77E-07
2-Chlorophenol	ND<	2.43E-07	ND<	2.27E-07
1,3-Dichlorobenzene	ND<	2.06E-07	ND<	1.92E-07
1,4-Dichlorobenzene	ND<	1.97E-07	ND<	1.84E-07
Benzyl Alcohol		3.83E-05		1.51E-04
1,2-Dichlorobenzene	ND<	2.11E-07	ND<	1.97E-07
2-Methylphenol	ND<	3.86E-07	ND<	3.60E-07
bis (2-Chloroisopropyl) ether	ND<	4.16E-07	ND<	3.88E-07
4-Methylphenol	ND<	3.80E-07	ND<	3.55E-07
n-Nitroso-di-n-propylamine	ND<	5.11E-07	ND<	4.77E-07
Hexachloroethane	ND<	4.14E-07	ND<	3.85E-07
Nitrobenzene	ND<	2.56E-07	ND<	2.49E-07
Isophorone	ND<	1.44E-07	ND<	1.40E-07
2-Nitrophenol	ND<	3.74E-07	ND<	3.64E-07
2,4-Dimethylphenol	ND<	3.16E-07	ND<	3.07E-07
Benzoic acid		5.06E-06		6.62E-06
Bis (2-chloroethoxy)-methane	ND<	3.20E-07	ND<	3.11E-07
2,4-Dichlorophenol	ND<	2.69E-07	ND<	2.61E-07
1,2,4-Trichlorobenzene	ND<	2.18E-07	ND<	2.13E-07
Naphthalene		1.36E-07		1.61E-07
4-Chloroanaline	ND<	2.07E-07	ND<	2.02E-07
Hexachlorobutadiene	ND<	2.63E-07	ND<	2.56E-07
4-chloro-3-methylphenol	ND<	3.29E-07	ND<	3.20E-07
2-Methylnaphthalene	ND<	1.27E-07	ND<	1.24E-07
Hexachlorocyclopentadiene	ND<	2.37E-07	ND<	2.28E-07
2,4,6-Trichlorophenol	ND<	2.95E-07	ND<	2.84E-07
2,4,5-Trichlorophenol	ND<	2.85E-07	ND<	2.75E-07
2-Chloronaphthalene	ND<	1.18E-07	ND<	1.14E-07
2-Nitroaniline	ND<	4.37E-07	ND<	4.20E-07
Dimethylphthalate	ND<	9.71E-08	ND<	9.40E-08
Acenaphthylene	ND<	7.58E-08	ND<	7.32E-08
2,6-Dinitrotoluene	ND<	4.18E-07	ND<	4.03E-07
3-Nitroaniline	ND<	3.80E-07	ND<	3.65E-07
Acenaphthene	ND<	1.36E-07	ND<	1.31E-07
2,4-Dinitrophenol	ND<	8.63E-07	ND<	8.30E-07
4-Nitrophenol	ND<	4.10E-07	ND<	3.95E-07
Dibenzofuran	ND<	7.89E-08	ND<	7.62E-08
2,4-Dinitrotoluene	ND<	2.72E-07	ND<	2.62E-07
Diethylpthalate		7.89E-07		3.57E-07
4-Chlorophenyl-phenyl ether	ND<	1.88E-07	ND<	1.81E-07
Fluorene	ND<	1.03E-07	ND<	9.89E-08
4-Nitroaniline	ND<	3.72E-07	ND<	3.58E-07
4,6-Dinitro-2-methylphenol	ND<	4.70E-07	ND<	4.39E-07
n-Nitrosodiphenylamine	ND<	1.52E-07	ND<	1.41E-07
4-Bromophenyl-phenyl ether	ND<	2.17E-07	ND<	2.04E-07
Hexachlorobenzene	ND<	1.56E-07	ND<	1.45E-07
Pentachlorophenol	ND<	2.72E-07	ND<	2.54E-07
Phenanthrene	ND<	5.97E-08	ND<	5.54E-08
Anthracene		3.54E-08	ND<	5.64E-08
Di-n-butylphthalate		2.17E-06		1.51E-06
Fluoranthene	ND<	4.55E-08	ND<	4.25E-08
Pyrene	ND<	3.34E-08	ND<	2.97E-08
Butylbenzylphthalate		3.94E-08	ND<	5.24E-08
3,3'-Dichlorobenzidine	ND<	9.51E-08	ND<	8.41E-08
Benzo(a)anthracene	ND<	3.54E-08	ND<	3.17E-08
Chrysene	ND<	3.84E-08	ND<	3.36E-08
bis(2-Ethylhexyl)phthalate		1.65E-06		1.78E-06
Di-n-octylphthalate	ND<	2.53E-08	ND<	2.77E-08
Benzo(b)fluoranthene	ND<	3.44E-08	ND<	3.86E-08
Benzo(k)fluoranthene	ND<	3.54E-08	ND<	3.96E-08
Benzo(a)pyrene	ND<	3.54E-08	ND<	3.96E-08
Indeno(1,2,3-cd)pyrene	ND<	3.64E-08	ND<	3.96E-08
Dibenzo(a,h)anthracene	ND<	4.85E-08	ND<	5.24E-08
Benzo(g,h,i)perylene	ND<	4.25E-08	ND<	4.65E-08

"ND<(....)" = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF TENTATIVELY IDENTIFIED SEMIVOLATILE ORGANIC COMPOUNDS
TEST DATA AND TEST RESULTS

TRIANGLE LABORATORY SEMI-VOLATILE DATA

TEST DATA			
Run number	T1	T2	FEILD BLANK
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	
SEMI-VOLATILE ORGANICS LABORATORY REPORT DATA, ug			
Benzaldehyde	1091	2749	4835
Methyl Ester Benzoic Acid	ND	ND	60
Alkylbenzene	ND	9	ND
Substituted Benzene	ND	403	1757
Substituted Benzaldehyde	12	18	10
Substituted Alkane	55	ND	ND
Triacetin	103	ND	330
Alkyl Methyl Ester Benzoic Acid	ND	10	12
Aromatic Ketone	12	16	9
Bibenzyl	55	207	56
Benzophenone	9	18	11
Substituted Amide	21	20	ND
Alkyl Acid	ND	ND	21
Substituted Aromatic Hydrocarbon	ND	ND	100
SEMIVOLATILE ORGANICS CONCENTRATIONS, ug/dscm			
Benzaldehyde	211.83	543.29	
Methyl Ester Benzoic Acid	ND	ND	
Alkylbenzene	ND	1.78	
Substituted Benzene	ND	79.65	
Substituted Benzaldehyde	2.33	3.56	
Substituted Alkane	10.68	ND	
Triacetin	20.00	ND	
Alkyl Methyl Ester Benzoic Acid	ND	1.98	
Aromatic Ketone	2.33	3.16	
Bibenzyl	10.68	40.91	
Benzophenone	1.75	3.56	
Substituted Amide	4.08	3.95	
Alkyl Acid	ND	ND	
Substituted Aromatic Hydrocarbon	ND	ND	
SEMIVOLATILE ORGANICS CONCENTRATIONS, lb/dscf			
Benzaldehyde	1.32E-08	3.39E-08	
Methyl Ester Benzoic Acid	ND	ND	
Alkylbenzene	ND	1.11E-10	
Substituted Benzene	ND	4.97E-09	
Substituted Benzaldehyde	1.45E-10	2.22E-10	
Substituted Alkane	6.67E-10	ND	
Triacetin	1.25E-09	ND	
Alkyl Methyl Ester Benzoic Acid	ND	1.23E-10	
Aromatic Ketone	1.45E-10	1.97E-10	
Bibenzyl	6.67E-10	2.55E-09	
Benzophenone	1.09E-10	2.22E-10	
Substituted Amide	2.55E-10	2.47E-10	
Alkyl Acid	ND	ND	
Substituted Aromatic Hydrocarbon	ND	ND	
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/hr			
Benzaldehyde	8.76E-04	2.16E-03	
Methyl Ester Benzoic Acid	ND	ND	
Alkylbenzene	ND	7.07E-06	
Substituted Benzene	ND	3.16E-04	
Substituted Benzaldehyde	9.63E-06	1.41E-05	
Substituted Alkane	4.41E-05	ND	
Triacetin	8.27E-05	ND	
Alkyl Methyl Ester Benzoic Acid	ND	7.85E-06	
Aromatic Ketone	9.63E-06	1.26E-05	
Bibenzyl	4.41E-05	1.63E-04	
Benzophenone	7.22E-06	1.41E-05	
Substituted Amide	1.69E-05	1.57E-05	
Alkyl Acid	ND	ND	
Substituted Aromatic Hydrocarbon	ND	ND	
SEMIVOLATILE ORGANICS EMISSION RESULTS, g/sec			
Benzaldehyde	1.10E-04	2.72E-04	
Methyl Ester Benzoic Acid	ND	ND	
Alkylbenzene	ND	8.90E-07	
Substituted Benzene	ND	3.99E-05	
Substituted Benzaldehyde	1.21E-06	1.78E-06	
Substituted Alkane	5.56E-06	ND	
Triacetin	1.04E-05	ND	
Alkyl Methyl Ester Benzoic Acid	ND	9.89E-07	
Aromatic Ketone	1.21E-06	1.58E-06	
Bibenzyl	5.56E-06	2.05E-05	
Benzophenone	9.10E-07	1.78E-06	
Substituted Amide	2.12E-06	1.98E-06	
Alkyl Acid	ND	ND	
Substituted Aromatic Hydrocarbon	ND	ND	

Note: Data not available for test T3.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF PARTICULATE, HCl AND Cl_2 TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0103	1407-2011	1408-2026
SAMPLING DATA			
Sampling duration, min.	320.0	320.0	320.0
Nozzle diameter, in.	0.620	0.620	0.620
Cross sectional nozzle area, sq.ft.	0.002097	0.002097	0.002097
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.71	0.69	0.56
Avg. dry gas meter temp., deg F	56	49	44
Avg. abs. dry gas meter temp., deg. R	516	509	504
Total liquid collected by train, ml	294.0	285.1	244.9
Std. vol. of H_2O vapor coll., cu.ft.	13.8	13.4	11.5
Dry gas meter calibration factor	1.0020	1.0020	1.0020
Sample vol. at meter cond., dcf	146.538	145.049	128.758
Sample vol. at std. cond., dscf (1)	149.429	149.381	136.963
Percent of isokinetic sampling	103.0	105.0	103.7
STACK GAS STREAM COMPOSITION DATA			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
CO,% by volume, dry basis	0.0	0.0	0.0
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.4	29.4	29.5
H_2O vapor in gas stream, prop. by vol.	0.085	0.082	0.078
Mole fraction of dry gas	0.915	0.918	0.922
Molecular wt. of wet gas, lb/lb mole	28.4	28.5	28.6
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA			
Static pressure, in. H_2O	-0.10	-0.10	-0.10
Static pressure, in. Hg	-0.007	-0.007	-0.007
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1675	1655	1643
Avg. absolute temperature, deg.R	2135	2115	2103
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	16	16	16
Avg. gas stream velocity, ft./sec.	16.0	15.6	14.0
Stack/duct cross sectional area, sq.ft.	4.59	4.59	4.59
Avg. gas stream volumetric flow, wacf/min.	4410	4300	3860
Avg. gas stream volumetric flow, dscf/min.	990	970	900
LABORATORY REPORT DATA			
Total Particulate, g	0.0028	0.0014	0.0038
Total HCl, mg	2.016	1.738	1.608
Total CL_2, mg	0.234	1.216	1.242
PARTICULATE EMISSIONS			
Concentration, gr/dscf	2.89E-04	1.45E-04	4.28E-04
Concentration, gr/dscf @ 7% O_2	4.52E-04	2.22E-04	6.56E-04
Concentration, gr/dscf @ 12% CO_2	6.05E-04	2.98E-04	8.41E-04
Mass rate, lbs/hr	0.002	0.001	0.003
HCl EMISSIONS			
Concentration, lbs/dscf	2.97E-08	2.56E-08	2.59E-08
Concentration, ppm/v	0.31	0.27	0.27
Mass rate, lbs/hr	1.77E-03	1.50E-03	1.40E-03
Cl_2 EMISSIONS			
Concentration, lbs/dscf	3.45E-09	1.79E-08	2.00E-08
Concentration, ppm/v	0.019	0.098	0.109
Mass rate, lbs/hr	2.06E-04	1.05E-03	1.08E-03

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mmHg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA				
Run number	T1	T1 (MID-SOAK)	T2	T3
Location		FURNACE DISCHARGE		
Date	01-31-96	02-01-96	02-02-96	02-04-96
Time period	1832-0122	0644-1005	1405-2100	1406-2106
SAMPLING DATA				
Sampling duration, min.	410.0	180.0	415.0	420.0
Nozzle diameter, in.	0.311	0.311	0.275	0.275
Cross sectional nozzle area, sq.ft.	0.000528	0.000528	0.000412	0.000412
Barometric pressure, in. Hg	29.73	29.76	29.59	30.28
Avg. orifice press. diff., in H_2O	1.85	1.17	0.77	0.69
Avg. dry gas meter temp., deg F	57	59	45	40
Avg. abs. dry gas meter temp., deg. R	517	519	505	500
Total liquid collected by train, ml	187.7	67.5	108.8	106.6
Std. vol. of H_2O vapor coll., cu.ft.	8.8	3.2	5.1	5.0
Dry gas meter calibration factor	1.0060	1.0060	1.0060	1.0060
Sample vol. at meter cond., dcf	288.854	104.276	194.617	179.138
Sample vol. at std. cond., dscf (1)	296.360	106.493	202.829	192.896
Percent of isokinetic sampling	99.7	101.4	102.5	101.0
GAS STREAM COMPOSITION DATA				
CO_2, % by volume, dry basis	1.3	1.5	0.2	1.5
O_2, % by volume, dry basis	19.8	19.3	19.1	19.4
CO, % by volume dry basis	0.0	0.0	0.0	0.0
N_2, % by volume, dry basis	79.0	79.2	80.7	79.1
Molecular wt. of dry gas, lb/lb mole	28.99	29.01	28.80	29.02
H2O vapor in gas stream, prop. by vol.	0.029	0.029	0.025	0.025
Mole fraction of dry gas	0.971	0.971	0.975	0.975
Molecular wt. of wet gas, lb/lb mole	28.7	28.7	28.5	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA				
Static pressure, in. H_2O	-0.78	-1.00	-0.70	-0.90
Static pressure, in. Hg	-0.057	-0.074	-0.051	-0.066
Absolute pressure, in. Hg	29.67	29.69	29.54	30.21
Avg. temperature, deg. F	291	475	356	403
Avg. absolute temperature, deg.R	751	935	816	863
Pitot tube coefficient	0.99	0.99	0.99	0.99
Total number of traverse points	1	1	1	1
Avg. gas stream velocity, ft./sec.	33.8	33.9	31.0	30.5
Stack/duct cross sectional area, sq.ft.	0.492	0.492	0.492	0.492
Avg. gas stream volumetric flow, wacf/min.	1000	1000	910	900
Avg. gas stream volumetric flow, dscf/min.	680	540	570	540

(1) Standard conditions = 68 °F (20 °C) and 29.92 inches Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA								
Run number		T1		T1 (MID-SOAK)		T2		T3
Location				FURNACE DISCHARGE				
Date		01-31-96		02-01-96		02-02-96		02-04-96
Time period		1832-0122		0644-1005		1405-2100		1406-2106
EXPLOSIVES LABORATORY REPORT DATA, ug								
HMX	ND<	462.0	ND<	28.60	ND<	462.0	ND<	462.0
RDX		1878.0		1.80		2880.0		1170.0
Trinitrobenzene (1,3,5-TNB)		854.0		8.00		579.0		483.0
Dinitrobenzene (1,3-DNB)		14.0	ND<	6.72		9.4		23.0
Nitrobenzene (NB)	ND<	109.2	ND<	6.72	ND<	109.2	ND<	109.2
Tetryl		316.0	ND<	19.40		205.0		124.0
2,4,6-Trinitrotoluene (TNT)		56000.0		151.60		10420.0		9960.0
2,6 Dinitrotoluene (2,6-DNT)	ND<	105.0	ND<	6.50		21.0	ND<	105.0
2,4-Dinitrotoluene (2,4-DNT)		76.0	ND<	6.50	ND<	105.0	ND<	105.0
EXPLOSIVES CONCENTRATIONS, ug/dscm								
HMX	ND<	55.0	ND<	9.5	ND<	80.4	ND<	84.6
RDX		223.8		0.6		501.4		214.2
Trinitrobenzene (1,3,5-TNB)		101.8		2.7		100.8		88.4
Dinitrobenzene (1,3-DNB)		1.7	ND<	2.2		1.6		4.2
Nitrobenzene (NB)	ND<	13.0	ND<	2.2	ND<	19.0	ND<	20.0
Tetryl		37.7	ND<	6.4		35.7		22.7
2,4,6-Trinitrotoluene (TNT)		6672.3		50.3		1814.0		1823.2
2,6 Dinitrotoluene (2,6-DNT)	ND<	12.5	ND<	2.2		3.7	ND<	19.2
2,4-Dinitrotoluene (2,4-DNT)		9.1	ND<	2.2	ND<	18.3	ND<	19.2
EXPLOSIVES CONCENTRATIONS, lb/dscf								
HMX	ND<	3.44E-09	ND<	5.92E-10	ND<	5.02E-09	ND<	5.28E-09
RDX		1.40E-08		3.73E-11		3.13E-08		1.34E-08
Trinitrobenzene (1,3,5-TNB)		6.35E-09		1.66E-10		6.29E-09		5.52E-09
Dinitrobenzene (1,3-DNB)		1.04E-10	ND<	1.39E-10		1.02E-10		2.63E-10
Nitrobenzene (NB)	ND<	8.12E-10	ND<	1.39E-10	ND<	1.19E-09	ND<	1.25E-09
Tetryl		2.35E-09	ND<	4.02E-10		2.23E-09		1.42E-09
2,4,6-Trinitrotoluene (TNT)		4.17E-07		3.14E-09		1.13E-07		1.14E-07
2,6 Dinitrotoluene (2,6-DNT)	ND<	7.81E-10	ND<	1.35E-10		2.28E-10	ND<	1.20E-09
2,4-Dinitrotoluene (2,4-DNT)		5.65E-10	ND<	1.35E-10	ND<	1.14E-09	ND<	1.20E-09

ND< = Analyte detection limit value.
NA = Sample was not analyzed for these compounds.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA				
Run number	T1	T1 (MID-SOAK)	T2	T3
Location		**FURNACE DISCHARGE**		
Date	01-31-96	02-01-96	02-02-96	02-04-96
Time period	1832-0122	0644-1005	1405-2100	1406-2106
EXPLOSIVES EMISSION RATES, lb/hr				
HMX	ND< 1.39E-04	ND< 1.93E-05	ND< 1.64E-04	ND< 1.80E-04
RDX	5.67E-04	1.22E-06	1.02E-03	4.56E-04
Trinitrobenzene (1,3,5-TNB)	2.58E-04	5.41E-06	2.05E-04	1.88E-04
Dinitrobenzene (1,3-DNB)	4.23E-06	ND< 4.54E-06	3.34E-06	8.97E-06
Nitrobenzene (NB)	ND< 3.30E-05	ND< 4.54E-06	ND< 3.88E-05	ND< 4.26E-05
Tetryl	9.54E-05	ND< 1.31E-05	7.27E-05	4.84E-05
2,4,6-Trinitrotoluene (TNT)	1.69E-02	1.02E-04	3.70E-03	3.89E-03
2,6 Dinitrotoluene (2,6-DNT)	ND< 3.17E-05	ND< 4.39E-06	7.45E-06	ND< 4.10E-05
2,4-Dinitrotoluene (2,4-DNT)	2.29E-05	ND< 4.39E-06	ND< 3.73E-05	ND< 4.10E-05
EXPLOSIVES CONCENTRATIONS, ppb/v				
HMX	ND< 4.47	ND< 0.77	ND< 6.53	ND< 6.87
RDX	24.23	0.06	54.30	23.20
Trinitrobenzene (1,3,5-TNB)	11.49	0.30	11.38	9.98
Dinitrobenzene (1,3-DNB)	0.24	ND< 0.32	0.23	0.60
Nitrobenzene (NB)	ND< 2.54	ND< 0.44	ND< 3.72	ND< 3.91
Tetryl	3.16	ND< 0.54	2.99	1.90
2,4,6-Trinitrotoluene (TNT)	707.18	5.33	192.26	193.24
2,6 Dinitrotoluene (2,6-DNT)	ND< 1.65	ND< 0.28	0.48	ND< 2.54
2,4-Dinitrotoluene (2,4-DNT)	1.20	ND< 0.28	ND< 2.41	ND< 2.54
EXPLOSIVES EMISSION RATES, g/sec				
HMX	ND< 1.76E-05	ND< 2.44E-06	ND< 2.07E-05	ND< 2.27E-05
RDX	7.14E-05	1.53E-07	1.29E-04	5.75E-05
Trinitrobenzene (1,3,5-TNB)	3.25E-05	6.81E-07	2.59E-05	2.37E-05
Dinitrobenzene (1,3-DNB)	5.32E-07	ND< 5.72E-07	4.20E-07	1.13E-06
Nitrobenzene (NB)	ND< 4.15E-06	ND< 5.72E-07	ND< 4.88E-06	ND< 5.37E-06
Tetryl	1.20E-05	ND< 1.65E-06	9.17E-06	6.10E-06
2,4,6-Trinitrotoluene (TNT)	2.13E-03	1.29E-05	4.66E-04	4.90E-04
2,6 Dinitrotoluene (2,6-DNT)	ND< 3.99E-06	ND< 5.54E-07	9.39E-07	ND< 5.16E-06
2,4-Dinitrotoluene (2,4-DNT)	2.89E-06	ND< 5.54E-07	ND< 4.69E-06	ND< 5.16E-06
SUMMARY OF DIESEL RANGE ORGANICS TEST RESULTS (1)				
Laboratory Report Data, ug	15400	NA	NA	NA
Concentration, ug/dscm	1834.9	NA	NA	NA
Concentration, lb/dscf	1.15E-07	NA	NA	NA
Concentration, ppb/v (2)	310.25	NA	NA	NA
Emission Rate, lb/hr	4.65E-03	NA	NA	NA
Emission Rate, g/sec	5.86E-04	NA	NA	NA

ND< = Analyte detection limit value.
NA = Sample was not analyzed for these compounds.
(1) The diesel range organic analysis was performed on T1 sample only.
(2) The reported ppb/v concentrations for these compounds is calculated using the molecular weight of decane.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
SAMPLING DATA			
Sampling duration, min.	360.0	360.0	360.0
Nozzle diameter, in.	0.622	0.622	0.622
Cross sectional nozzle area, sq.ft.	0.002110	0.002110	0.002110
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.86	0.80	0.62
Avg. dry gas meter temp., deg F	53	43	38
Avg. abs. dry gas meter temp., deg. R	513	503	498
Total liquid collected by train, ml	343.2	326.0	231.4
Std. vol. of H_2O vapor coll., cu.ft.	16.2	15.3	10.9
Dry gas meter calibration factor	1.0050	1.0050	1.0050
Sample vol. at meter cond., dcf	176.562	171.137	145.923
Sample vol. at std. cond., dscf (1)	181.864	178.670	157.476
Percent of isokinetic sampling	99.5	101.8	97.8
GAS STREAM COMPOSITION DATA			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
CO, % by volume dry basis	0.0	0.0	0.0
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.40	29.41	29.45
H2O vapor in gas stream, prop. by vol.	0.082	0.079	0.065
Mole fraction of dry gas	0.918	0.921	0.935
Molecular wt. of wet gas, lb/lb mole	28.5	28.5	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA			
Static pressure, in. H_2O	-0.10	-0.10	-0.10
Static pressure, in. Hg	-0.007	-0.007	-0.007
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1560	1515	1510
Avg. absolute temperature, deg.R	2020	1975	1970
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	16.8	15.8	13.9
Stack/duct cross sectional area, sq.ft.	4.587	4.587	4.587
Avg. gas stream volumetric flow, wacf/min.	4630	4360	3840
Avg. gas stream volumetric flow, dscf/min.	1100	1060	970

(1) Standard conditions = 68 °F (20 °C) and 29.92 inches Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
EXPLOSIVES LABORATORY REPORT DATA, ug			
HMX	ND< 26.40	ND< 28.60	ND< 28.60
RDX	ND< 12.00	ND< 13.00	ND< 13.00
Trinitrobenzene (1,3,5-TNB)	ND< 6.00	ND< 6.50	ND< 6.50
Dinitrobenzene (1,3-DNB)	ND< 6.24	ND< 6.72	ND< 6.72
Nitrobenzene (NB)	ND< 6.24	ND< 6.72	ND< 6.72
Tetryl	ND< 18.00	ND< 19.40	ND< 19.40
2,4,6-Trinitrotoluene (TNT)	ND< 6.00	ND< 6.50	ND< 6.50
2,6 Dinitrotoluene (2,6-DNT)	ND< 6.00	ND< 6.50	ND< 6.50
2,4-Dinitrotoluene (2,4-DNT)	ND< 6.00	ND< 6.50	ND< 6.50
EXPLOSIVES CONCENTRATIONS, ug/dscm			
HMX	ND< 5.13	ND< 5.65	ND< 6.41
RDX	ND< 2.33	ND< 2.57	ND< 2.91
Trinitrobenzene (1,3,5-TNB)	ND< 1.16	ND< 1.28	ND< 1.46
Dinitrobenzene (1,3-DNB)	ND< 1.21	ND< 1.33	ND< 1.51
Nitrobenzene (NB)	ND< 1.21	ND< 1.33	ND< 1.51
Tetryl	ND< 3.49	ND< 3.83	ND< 4.35
2,4,6-Trinitrotoluene (TNT)	ND< 1.16	ND< 1.28	ND< 1.46
2,6 Dinitrotoluene (2,6-DNT)	ND< 1.16	ND< 1.28	ND< 1.46
2,4-Dinitrotoluene (2,4-DNT)	ND< 1.16	ND< 1.28	ND< 1.46
EXPLOSIVES CONCENTRATIONS, lb/dscf			
HMX	ND< 3.20E-10	ND< 3.53E-10	ND< 4.00E-10
RDX	ND< 1.45E-10	ND< 1.60E-10	ND< 1.82E-10
Trinitrobenzene (1,3,5-TNB)	ND< 7.27E-11	ND< 8.02E-11	ND< 9.10E-11
Dinitrobenzene (1,3-DNB)	ND< 7.56E-11	ND< 8.29E-11	ND< 9.41E-11
Nitrobenzene (NB)	ND< 7.56E-11	ND< 8.29E-11	ND< 9.41E-11
Tetryl	ND< 2.18E-10	ND< 2.39E-10	ND< 2.72E-10
2,4,6-Trinitrotoluene (TNT)	ND< 7.27E-11	ND< 8.02E-11	ND< 9.10E-11
2,6 Dinitrotoluene (2,6-DNT)	ND< 7.27E-11	ND< 8.02E-11	ND< 9.10E-11
2,4-Dinitrotoluene (2,4-DNT)	ND< 7.27E-11	ND< 8.02E-11	ND< 9.10E-11

ND< = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF EXPLOSIVE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA						
Run number		T1		T2		T3
Location				AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96		02-04-96
Time period		1834-0110		1406-2031		1409-2036
EXPLOSIVES EMISSION RATES, lb/hr						
HMX	ND<	2.12E-05	ND<	2.25E-05	ND<	2.34E-05
RDX	ND<	9.63E-06	ND<	1.02E-05	ND<	1.06E-05
Trinitrobenzene (1,3,5-TNB)	ND<	4.82E-06	ND<	5.10E-06	ND<	5.31E-06
Dinitrobenzene (1,3-DNB)	ND<	5.01E-06	ND<	5.28E-06	ND<	5.49E-06
Nitrobenzene (NB)	ND<	5.01E-06	ND<	5.28E-06	ND<	5.49E-06
Tetryl	ND<	1.44E-05	ND<	1.52E-05	ND<	1.59E-05
2,4,6-Trinitrotoluene (TNT)	ND<	4.82E-06	ND<	5.10E-06	ND<	5.31E-06
2,6 Dinitrotoluene (2,6-DNT)	ND<	4.82E-06	ND<	5.10E-06	ND<	5.31E-06
2,4-Dinitrotoluene (2,4-DNT)	ND<	4.82E-06	ND<	5.10E-06	ND<	5.31E-06
EXPLOSIVES CONCENTRATIONS, ppb/v						
HMX	ND<	0.42	ND<	0.46	ND<	0.52
RDX	ND<	0.25	ND<	0.28	ND<	0.32
Trinitrobenzene (1,3,5-TNB)	ND<	0.13	ND<	0.15	ND<	0.16
Dinitrobenzene (1,3-DNB)	ND<	0.17	ND<	0.19	ND<	0.22
Nitrobenzene (NB)	ND<	0.24	ND<	0.26	ND<	0.29
Tetryl	ND<	0.29	ND<	0.32	ND<	0.36
2,4,6-Trinitrotoluene (TNT)	ND<	0.12	ND<	0.14	ND<	0.15
2,6 Dinitrotoluene (2,6-DNT)	ND<	0.15	ND<	0.17	ND<	0.19
2,4-Dinitrotoluene (2,4-DNT)	ND<	0.15	ND<	0.17	ND<	0.19
EXPLOSIVES EMISSION RATES, g/sec						
HMX	ND<	2.67E-06	ND<	2.83E-06	ND<	2.95E-06
RDX	ND<	1.21E-06	ND<	1.29E-06	ND<	1.34E-06
Trinitrobenzene (1,3,5-TNB)	ND<	6.07E-07	ND<	6.43E-07	ND<	6.69E-07
Dinitrobenzene (1,3-DNB)	ND<	6.31E-07	ND<	6.65E-07	ND<	6.92E-07
Nitrobenzene (NB)	ND<	6.31E-07	ND<	6.65E-07	ND<	6.92E-07
Tetryl	ND<	1.82E-06	ND<	1.92E-06	ND<	2.00E-06
2,4,6-Trinitrotoluene (TNT)	ND<	6.07E-07	ND<	6.43E-07	ND<	6.69E-07
2,6 Dinitrotoluene (2,6-DNT)	ND<	6.07E-07	ND<	6.43E-07	ND<	6.69E-07
2,4-Dinitrotoluene (2,4-DNT)	ND<	6.07E-07	ND<	6.43E-07	ND<	6.69E-07

ND< = Analyte detection limit value.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
SAMPLING DATA			
Sampling duration, min.	360.0	360.0	360.0
Nozzle diameter, in.	0.622	0.622	0.622
Cross sectional nozzle area, sq.ft.	0.002110	0.002110	0.002110
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.86	0.80	0.62
Avg. dry gas meter temp., deg F	53	43	38
Avg. abs. dry gas meter temp., deg. R	513	503	498
Total liquid collected by train, ml	343.2	326.0	231.4
Std. vol. of H_2O vapor coll., cu.ft.	16.2	15.3	10.9
Dry gas meter calibration factor	1.0050	1.0050	1.0050
Sample vol. at meter cond., dcf	176.562	171.137	145.923
Sample vol. at std. cond., dscf (1)	181.864	178.670	157.476
Percent of isokinetic sampling	99.5	101.8	97.8
GAS STREAM COMPOSITION DATA			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
CO, % by volume dry basis	0.0	0.0	0.0
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.40	29.41	29.45
H2O vapor in gas stream, prop. by vol.	0.082	0.079	0.065
Mole fraction of dry gas	0.918	0.921	0.935
Molecular wt. of wet gas, lb/lb mole	28.5	28.5	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA			
Static pressure, in. H_2O	-0.10	-0.10	-0.10
Static pressure, in. Hg	-0.007	-0.007	-0.007
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1560	1515	1510
Avg. absolute temperature, deg.R	2020	1975	1970
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	16.8	15.8	13.9
Stack/duct cross sectional area, sq.ft.	4.587	4.587	4.587
Avg. gas stream volumetric flow, wacf/min.	4630	4360	3840
Avg. gas stream volumetric flow, dscf/min.	1100	1060	970

(1) Standard conditions = 68 °F (20 °C) and 29.92 inches Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA						
Run number		T1		T2		T3
Location				AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96		02-04-96
Time period		1834-0110		1406-2031		1409-2036
SEMI-VOLATILE ORGANICS LABORATORY REPORT DATA, ug						
Phenol	ND<	300	ND<	300	ND<	300
Bis (2-chloroethyl) ether	ND<	300	ND<	300	ND<	300
2-Chlorophenol	ND<	300	ND<	300	ND<	300
1,3-Dichlorobenzene	ND<	300	ND<	300	ND<	300
1,4-Dichlorobenzene	ND<	300	ND<	300	ND<	300
Benzyl Alcohol	ND<	300	ND<	300	ND<	300
1,2-Dichlorobenzene	ND<	300	ND<	300	ND<	300
2-Methylphenol	ND<	300	ND<	300	ND<	300
bis (2-Chloroisopropyl) ether	ND<	300	ND<	300	ND<	300
4-Methylphenol	ND<	300	ND<	300	ND<	300
n-Nitroso-di-n-propylamine	ND<	300	ND<	300	ND<	300
Hexachloroethane	ND<	300	ND<	300	ND<	300
Nitrobenzene	ND<	300	ND<	300	ND<	300
Isophorone	ND<	300	ND<	300	ND<	300
2-Nitrophenol	ND<	300	ND<	300	ND<	300
2,4-Dimethylphenol	ND<	300	ND<	300	ND<	300
Benzoic acid	ND<	1440	ND<	1440	ND<	1440
Bis (2-chloroethoxy)-methane	ND<	300	ND<	300	ND<	300
2,4-Dichlorophenol	ND<	300	ND<	300	ND<	300
1,2,4-Trichlorobenzene	ND<	300	ND<	300	ND<	300
Naphthalene	ND<	300	ND<	300	ND<	300
4-Chloroanaline	ND<	300	ND<	300	ND<	300
Hexachlorobutadiene	ND<	300	ND<	300	ND<	300
4-chloro-3-methylphenol	ND<	300	ND<	300	ND<	300
2-Methylnaphthalene	ND<	300	ND<	300	ND<	300
Hexachlorocyclopentadiene	ND<	300	ND<	300	ND<	300
2,4,6-Trichlorophenol	ND<	300	ND<	300	ND<	300
2,4,5-Trichlorophenol	ND<	1440	ND<	1440	ND<	1440
2-Chloronaphthalene	ND<	300	ND<	300	ND<	300
2-Nitroaniline	ND<	1440	ND<	1440	ND<	1440
Dimethylphthalate	ND<	300	ND<	300	ND<	300
Acenaphthylene	ND<	300	ND<	300	ND<	300
2,6-Dinitrotoluene	ND<	300	ND<	300	ND<	300
3-Nitroaniline	ND<	1440	ND<	1440	ND<	1440
Acenaphthene	ND<	300	ND<	300	ND<	300
2,4-Dinitrophenol	ND<	1440	ND<	1440	ND<	1440
4-Nitrophenol	ND<	1440	ND<	1440	ND<	1440
Dibenzofuran	ND<	300	ND<	300	ND<	300
2,4-Dinitrotoluene	ND<	300	ND<	300	ND<	300
Diethylpthalate		8 J		34 J	ND<	300
4-Chlorophenyl-phenyl ether	ND<	300	ND<	300	ND<	300
Fluorene	ND<	300	ND<	300	ND<	300
4-Nitroaniline	ND<	1440	ND<	1440	ND<	1440
4,6-Dinitro-2-methylphenol	ND<	1440	ND<	1440	ND<	1440
n-Nitrosodiphenylamine	ND<	300	ND<	300	ND<	300
4-Bromophenyl-phenyl ether	ND<	300	ND<	300	ND<	300
Hexachlorobenzene	ND<	300	ND<	300	ND<	300
Pentachlorophenol		3 J		14 J	ND<	1440
Phenanthrene	ND<	300	ND<	300	ND<	300
Anthracene	ND<	300	ND<	300	ND<	300
Di-n-butylphthalate		5 J	ND<	300	ND<	300
Fluoranthene	ND<	300	ND<	300	ND<	300
Pyrene	ND<	300	ND<	300	ND<	300
Butylbenzylphthalate	ND<	300	ND<	300	ND<	300
3,3'-Dichlorobenzidine	ND<	600	ND<	600	ND<	600
Benzo(a)anthracene	ND<	300		3 J	ND<	300
Chrysene	ND<	300		2 J	ND<	300
bis(2-Ethylhexyl)phthalate		23 JB		11 JB		11 JB
Di-n-octylphthalate	ND<	300		2 J	ND<	300
Benzo(b)fluoranthene	ND<	300	ND<	300	ND<	300
Benzo(k)fluoranthene	ND<	300	ND<	300	ND<	300
Benzo(a)pyrene	ND<	300	ND<	300	ND<	300
Indeno(1,2,3-cd)pyrene	ND<	300	ND<	300	ND<	300
Dibenzo(a,h)anthracene	ND<	300	ND<	300	ND<	300
Benzo(g,h,i)perylene	ND<	300	ND<	300	ND<	300
Carbazole	ND<	300	ND<	300	ND<	300
Diesel Range Organics (1)	ND<	6000		NA		NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA						
Run number		T1		T2		T3
Location			AFTERBURNER DISCHARGE			
Date		01-31-96		02-02-96		02-04-96
Time period		1834-0110		1406-2031		1409-2036
SEMIVOLATILE ORGANICS CONCENTRATIONS, ug/dscm						
Phenol	ND<	58.25	ND<	59.29	ND<	67.27
Bis (2-chloroethyl) ether	ND<	58.25	ND<	59.29	ND<	67.27
2-Chlorophenol	ND<	58.25	ND<	59.29	ND<	67.27
1,3-Dichlorobenzene	ND<	58.25	ND<	59.29	ND<	67.27
1,4-Dichlorobenzene	ND<	58.25	ND<	59.29	ND<	67.27
Benzyl Alcohol	ND<	58.25	ND<	59.29	ND<	67.27
1,2-Dichlorobenzene	ND<	58.25	ND<	59.29	ND<	67.27
2-Methylphenol	ND<	58.25	ND<	59.29	ND<	67.27
bis (2-Chloroisopropyl) ether	ND<	58.25	ND<	59.29	ND<	67.27
4-Methylphenol	ND<	58.25	ND<	59.29	ND<	67.27
n-Nitroso-di-n-propylamine	ND<	58.25	ND<	59.29	ND<	67.27
Hexachloroethane	ND<	58.25	ND<	59.29	ND<	67.27
Nitrobenzene	ND<	58.25	ND<	59.29	ND<	67.27
Isophorone	ND<	58.25	ND<	59.29	ND<	67.27
2-Nitrophenol	ND<	58.25	ND<	59.29	ND<	67.27
2,4-Dimethylphenol	ND<	58.25	ND<	59.29	ND<	67.27
Benzoic acid	ND<	279.59	ND<	284.59	ND<	322.89
Bis (2-chloroethoxy)-methane	ND<	58.25	ND<	59.29	ND<	67.27
2,4-Dichlorophenol	ND<	58.25	ND<	59.29	ND<	67.27
1,2,4-Trichlorobenzene	ND<	58.25	ND<	59.29	ND<	67.27
Naphthalene	ND<	58.25	ND<	59.29	ND<	67.27
4-Chloroanaline	ND<	58.25	ND<	59.29	ND<	67.27
Hexachlorobutadiene	ND<	58.25	ND<	59.29	ND<	67.27
4-chloro-3-methylphenol	ND<	58.25	ND<	59.29	ND<	67.27
2-Methylnaphthalene	ND<	58.25	ND<	59.29	ND<	67.27
Hexachlorocyclopentadiene	ND<	58.25	ND<	59.29	ND<	67.27
2,4,6-Trichlorophenol	ND<	58.25	ND<	59.29	ND<	67.27
2,4,5-Trichlorophenol	ND<	279.59	ND<	284.59	ND<	322.89
2-Chloronaphthalene	ND<	58.25	ND<	59.29	ND<	67.27
2-Nitroaniline	ND<	279.59	ND<	284.59	ND<	322.89
Dimethylphthalate	ND<	58.25	ND<	59.29	ND<	67.27
Acenaphthylene	ND<	58.25	ND<	59.29	ND<	67.27
2,6-Dinitrotoluene	ND<	58.25	ND<	59.29	ND<	67.27
3-Nitroaniline	ND<	279.59	ND<	284.59	ND<	322.89
Acenaphthene	ND<	58.25	ND<	59.29	ND<	67.27
2,4-Dinitrophenol	ND<	279.59	ND<	284.59	ND<	322.89
4-Nitrophenol	ND<	279.59	ND<	284.59	ND<	322.89
Dibenzofuran	ND<	58.25	ND<	59.29	ND<	67.27
2,4-Dinitrotoluene	ND<	58.25	ND<	59.29	ND<	67.27
Diethylpthalate		1.55 J		6.72 J	ND<	67.27
4-Chlorophenyl-phenyl ether	ND<	58.25	ND<	59.29	ND<	67.27
Fluorene	ND<	58.25	ND<	59.29	ND<	67.27
4-Nitroaniline	ND<	279.59	ND<	284.59	ND<	322.89
4,6-Dinitro-2-methylphenol	ND<	279.59	ND<	284.59	ND<	322.89
n-Nitrosodiphenylamine	ND<	58.25	ND<	59.29	ND<	67.27
4-Bromophenyl-phenyl ether	ND<	58.25	ND<	59.29	ND<	67.27
Hexachlorobenzene	ND<	58.25	ND<	59.29	ND<	67.27
Pentachlorophenol		0.58 J		2.77 J	ND<	322.89
Phenanthrene	ND<	58.25	ND<	59.29	ND<	67.27
Anthracene	ND<	58.25	ND<	59.29	ND<	67.27
Di-n-butylphthalate		0.97 J	ND<	59.29	ND<	67.27
Fluoranthene	ND<	58.25	ND<	59.29	ND<	67.27
Pyrene	ND<	58.25	ND<	59.29	ND<	67.27
Butylbenzylphthalate	ND<	58.25	ND<	59.29	ND<	67.269
3,3'-Dichlorobenzidine	ND<	116.50	ND<	118.58	ND<	134.54
Benzo(a)anthracene	ND<	58.25		0.59 J	ND<	67.27
Chrysene	ND<	58.25		0.40 J	ND<	67.27
bis(2-Ethylhexyl)phthalate		4.47 JB		2.17 JB		2.47 JB
Di-n-octylphthalate	ND<	58.25		0.40 J	ND<	67.27
Benzo(b)fluoranthene	ND<	58.25	ND<	59.29	ND<	67.27
Benzo(k)fluoranthene	ND<	58.25	ND<	59.29	ND<	67.27
Benzo(a)pyrene	ND<	58.25	ND<	59.29	ND<	67.27
Indeno(1,2,3-cd)pyrene	ND<	58.25	ND<	59.29	ND<	67.27
Dibenzo(a,h)anthracene	ND<	58.25	ND<	59.29	ND<	67.27
Benzo(g,h,i)perylene	ND<	58.25	ND<	59.29	ND<	67.27
Carbazole	ND<	58.25	ND<	59.29	ND<	67.27
Diesel Range Organics (1)	ND<	1164.96		NA		NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
SEMIVOLATILE ORGANICS CONCENTRATIONS, lb/dscf			
Phenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Bis (2-chloroethyl) ether	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2-Chlorophenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
1,3-Dichlorobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
1,4-Dichlorobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Benzyl Alcohol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
1,2-Dichlorobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2-Methylphenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
bis (2-Chloroisopropyl) ether	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
4-Methylphenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
n-Nitroso-di-n-propylamine	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Hexachloroethane	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Nitrobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Isophorone	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2-Nitrophenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4-Dimethylphenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Benzoic acid	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
Bis (2-chloroethoxy)-methane	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4-Dichlorophenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
1,2,4-Trichlorobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Naphthalene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
4-Chloroanaline	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Hexachlorobutadiene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
4-chloro-3-methylphenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2-Methylnaphthalene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Hexachlorocyclopentadiene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4,6-Trichlorophenol	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4,5-Trichlorophenol	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
2-Chloronaphthalene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2-Nitroaniline	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
Dimethylphthalate	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Acenaphthylene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,6-Dinitrotoluene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
3-Nitroaniline	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
Acenaphthene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4-Dinitrophenol	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
4-Nitrophenol	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
Dibenzofuran	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
2,4-Dinitrotoluene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Diethylpthalate	9.70E-11 J	4.20E-10 J	ND< 4.20E-09
4-Chlorophenyl-phenyl ether	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Fluorene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
4-Nitroaniline	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
4,6-Dinitro-2-methylphenol	ND< 1.75E-08	ND< 1.78E-08	ND< 2.02E-08
n-Nitrosodiphenylamine	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
4-Bromophenyl-phenyl ether	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Hexachlorobenzene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Pentachlorophenol	3.64E-11 J	1.73E-10 J	ND< 2.02E-08
Phenanthrene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Anthracene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Di-n-butylphthalate	6.06E-11 J	ND< 3.70E-09	ND< 4.20E-09
Fluoranthene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Pyrene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Butylbenzylphthalate	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
3,3'-Dichlorobenzidine	ND< 7.27E-09	ND< 7.40E-09	ND< 8.40E-09
Benzo(a)anthracene	ND< 3.64E-09	3.70E-11 J	ND< 4.20E-09
Chrysene	ND< 3.64E-09	2.47E-11 J	ND< 4.20E-09
bis(2-Ethylhexyl)phthalate	2.79E-10 JB	1.36E-10 JB	1.54E-10 JB
Di-n-octylphthalate	ND< 3.64E-09	2.47E-11 J	ND< 4.20E-09
Benzo(b)fluoranthene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Benzo(k)fluoranthene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Benzo(a)pyrene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Indeno(1,2,3-cd)pyrene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Dibenzo(a,h)anthracene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Benzo(g,h,i)perylene	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Carbazole	ND< 3.64E-09	ND< 3.70E-09	ND< 4.20E-09
Diesel Range Organics (1)	ND< 7.27E-08	NA	NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		**AFTERBURNER DISCHARGE**	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
SEMIVOLATILE ORGANICS EMISSION RESULTS, lb/hr			
Phenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Bis (2-chloroethyl) ether	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2-Chlorophenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
1,3-Dichlorobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
1,4-Dichlorobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Benzyl Alcohol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
1,2-Dichlorobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2-Methylphenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
bis (2-Chloroisopropyl) ether	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
4-Methylphenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
n-Nitroso-di-n-propylamine	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Hexachloroethane	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Nitrobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Isophorone	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2-Nitrophenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4-Dimethylphenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Benzoic acid	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
Bis (2-chloroethoxy)-methane	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4-Dichlorophenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
1,2,4-Trichlorobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Naphthalene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
4-Chloroanaline	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Hexachlorobutadiene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
4-chloro-3-methylphenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2-Methylnaphthalene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Hexachlorocyclopentadiene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4,6-Trichlorophenol	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4,5-Trichlorophenol	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
2-Chloronaphthalene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2-Nitroaniline	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
Dimethylphthalate	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Acenaphthylene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,6-Dinitrotoluene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
3-Nitroaniline	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
Acenaphthene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4-Dinitrophenol	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
4-Nitrophenol	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
Dibenzofuran	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
2,4-Dinitrotoluene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Diethylpthalate	6.42E-06 J	2.67E-05 J	ND< 2.45E-04
4-Chlorophenyl-phenyl ether	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Fluorene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
4-Nitroaniline	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
4,6-Dinitro-2-methylphenol	ND< 1.16E-03	ND< 1.13E-03	ND< 1.18E-03
n-Nitrosodiphenylamine	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
4-Bromophenyl-phenyl ether	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Hexachlorobenzene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Pentachlorophenol	2.41E-06 J	1.10E-05 J	ND< 1.18E-03
Phenanthrene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Anthracene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Di-n-butylphthalate	4.01E-06 J	ND< 2.36E-04	ND< 2.45E-04
Fluoranthene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Pyrene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Butylbenzylphthalate	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
3,3'-Dichlorobenzidine	ND< 4.82E-04	ND< 4.71E-04	ND< 4.90E-04
Benzo(a)anthracene	ND< 2.41E-04	2.36E-06 J	ND< 2.45E-04
Chrysene	ND< 2.41E-04	1.57E-06 J	ND< 2.45E-04
bis(2-Ethylhexyl)phthalate	1.85E-05 JB	8.64E-06 JB	8.99E-06 JB
Di-n-octylphthalate	ND< 2.41E-04	1.57E-06 J	ND< 2.45E-04
Benzo(b)fluoranthene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Benzo(k)fluoranthene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Benzo(a)pyrene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Indeno(1,2,3-cd)pyrene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Dibenzo(a,h)anthracene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Benzo(g,h,i)perylene	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Carbazole	ND< 2.41E-04	ND< 2.36E-04	ND< 2.45E-04
Diesel Range Organics (1)	ND< 4.82E-03	NA	NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA						
Run number		T1		T2		T3
Location				AFTERBURNER DISCHARGE		
Date		01-31-96		02-02-96		02-04-96
Time period		1834-0110		1406-2031		1409-2036
SEMIVOLATILE ORGANICS CONCENTRATIONS, ppb/v						
Phenol	ND<	14.89	ND<	15.16	ND<	17.20
Bis (2-chloroethyl) ether	ND<	9.80	ND<	9.97	ND<	11.32
2-Chlorophenol	ND<	10.90	ND<	11.10	ND<	12.59
1,3-Dichlorobenzene	ND<	9.53	ND<	9.70	ND<	11.01
1,4-Dichlorobenzene	ND<	9.53	ND<	9.70	ND<	11.01
Benzyl Alcohol	ND<	12.959	ND<	13.19	ND<	14.966
1,2-Dichlorobenzene	ND<	9.53	ND<	9.70	ND<	11.01
2-Methylphenol	ND<	12.96	ND<	13.19	ND<	14.97
bis (2-Chloroisopropyl) ether	ND<	8.24	ND<	8.39	ND<	9.52
4-Methylphenol	ND<	12.96	ND<	13.19	ND<	14.97
n-Nitroso-di-n-propylamine	ND<	10.76	ND<	10.95	ND<	12.43
Hexachloroethane	ND<	5.92	ND<	6.03	ND<	6.84
Nitrobenzene	ND<	11.38	ND<	11.59	ND<	13.15
Isophorone	ND<	10.14	ND<	10.32	ND<	11.71
2-Nitrophenol	ND<	10.07	ND<	10.25	ND<	11.63
2,4-Dimethylphenol	ND<	11.47	ND<	11.67	ND<	13.25
Benzoic acid	ND<	55.08	ND<	56.07	ND<	63.61
Bis (2-chloroethoxy)-methane	ND<	8.10	ND<	8.24	ND<	9.35
2,4-Dichlorophenol	ND<	8.60	ND<	8.75	ND<	9.93
1,2,4-Trichlorobenzene	ND<	7.72	ND<	7.86	ND<	8.92
Naphthalene	ND<	10.93	ND<	11.128	ND<	12.626
4-Chloroanaline	ND<	10.98	ND<	11.18	ND<	12.69
Hexachlorobutadiene	ND<	5.37	ND<	5.47	ND<	6.21
4-chloro-3-methylphenol	ND<	9.83	ND<	10.00	ND<	11.35
2-Methylnaphthalene	ND<	9.855	ND<	10.031	ND<	11.381
Hexachlorocyclopentadiene	ND<	5.14	ND<	5.23	ND<	5.93
2,4,6-Trichlorophenol	ND<	7.10	ND<	7.22	ND<	8.20
2,4,5-Trichlorophenol	ND<	34.07	ND<	34.68	ND<	39.34
2-Chloronaphthalene	ND<	8.62	ND<	8.77	ND<	9.95
2-Nitroaniline	ND<	48.70	ND<	49.57	ND<	56.24
Dimethylphthalate	ND<	7.22	ND<	7.35	ND<	8.33
Acenaphthylene	ND<	9.21	ND<	9.37	ND<	10.63
2,6-Dinitrotoluene	ND<	7.69	ND<	7.83	ND<	8.89
3-Nitroaniline	ND<	48.70	ND<	49.57	ND<	56.24
Acenaphthene	ND<	9.09	ND<	9.25	ND<	10.49
2,4-Dinitrophenol	ND<	36.53	ND<	37.19	ND<	42.19
4-Nitrophenol	ND<	48.35	ND<	49.22	ND<	55.84
Dibenzofuran	ND<	8.33	ND<	8.48	ND<	9.62
2,4-Dinitrotoluene	ND<	7.69	ND<	7.83	ND<	8.89
Diethylpthalate		0.168 J		0.73 J	ND<	7.28
4-Chlorophenyl-phenyl ether	ND<	6.87	ND<	6.99	ND<	7.93
Fluorene	ND<	8.43	ND<	8.58	ND<	9.74
4-Nitroaniline	ND<	48.70	ND<	49.57	ND<	56.24
4,6-Dinitro-2-methylphenol	ND<	33.96	ND<	34.56	ND<	39.21
n-Nitrosodiphenylamine	ND<	7.07	ND<	7.20	ND<	8.16
4-Bromophenyl-phenyl ether	ND<	5.65	ND<	5.75	ND<	6.53
Hexachlorobenzene	ND<	4.92	ND<	5.01	ND<	5.68
Pentachlorophenol		0.05 J		0.25 J	ND<	29.17
Phenanthrene	ND<	7.862	ND<	8.00	ND<	9.08
Anthracene	ND<	7.86	ND<	8.00	ND<	9.08
Di-n-butylphthalate		0.08 J	ND<	5.12	ND<	5.81
Fluoranthene	ND<	6.929	ND<	7.05	ND<	8.00
Pyrene	ND<	6.93	ND<	7.05	ND<	8.00
Butylbenzylphthalate	ND<	4.486	ND<	4.566	ND<	5.1808
3,3'-Dichlorobenzidine	ND<	11.07	ND<	11.27	ND<	12.79
Benzo(a)anthracene	ND<	6.14		0.06 J	ND<	7.09
Chrysene	ND<	6.14		0.04 J	ND<	7.09
bis(2-Ethylhexyl)phthalate		0.28 JB		0.13 JB		0.15 JB
Di-n-octylphthalate	ND<	3.59		0.02 J	ND<	4.14
Benzo(b)fluoranthene	ND<	5.55	ND<	5.65	ND<	6.41
Benzo(k)fluoranthene	ND<	5.55	ND<	5.65	ND<	6.41
Benzo(a)pyrene	ND<	5.55	ND<	5.65	ND<	6.41
Indeno(1,2,3-cd)pyrene	ND<	5.07	ND<	5.16	ND<	5.86
Dibenzo(a,h)anthracene	ND<	5.03	ND<	5.12	ND<	5.81
Benzo(g,h,i)perylene	ND<	5.07	ND<	5.16	ND<	5.86
Carbazole	ND<	8.38	ND<	8.53	ND<	9.68
Diesel Range Organics (1)	ND<	196.98		NA		NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF SEMIVOLATILE ORGANIC COMPOUNDS TEST DATA AND TEST RESULTS

TEST DATA			
Run number	T1	T2	T3
Location		AFTERBURNER DISCHARGE	
Date	01-31-96	02-02-96	02-04-96
Time period	1834-0110	1406-2031	1409-2036
SEMIVOLATILE ORGANICS EMISSION RESULTS, g/sec			
Phenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Bis (2-chloroethyl) ether	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2-Chlorophenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
1,3-Dichlorobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
1,4-Dichlorobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Benzyl Alcohol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
1,2-Dichlorobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2-Methylphenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
bis (2-Chloroisopropyl) ether	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
4-Methylphenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
n-Nitroso-di-n-propylamine	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Hexachloroethane	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Nitrobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Isophorone	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2-Nitrophenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4-Dimethylphenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Benzoic acid	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
Bis (2-chloroethoxy)-methane	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4-Dichlorophenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
1,2,4-Trichlorobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Naphthalene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
4-Chloroanaline	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Hexachlorobutadiene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
4-chloro-3-methylphenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2-Methylnaphthalene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Hexachlorocyclopentadiene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4,6-Trichlorophenol	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4,5-Trichlorophenol	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
2-Chloronaphthalene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2-Nitroaniline	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
Dimethylphthalate	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Acenaphthylene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,6-Dinitrotoluene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
3-Nitroaniline	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
Acenaphthene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4-Dinitrophenol	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
4-Nitrophenol	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
Dibenzofuran	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
2,4-Dinitrotoluene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Diethylpthalate	8.09E-07 J	3.36E-06 J	ND< 3.09E-05
4-Chlorophenyl-phenyl ether	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Fluorene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
4-Nitroaniline	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
4,6-Dinitro-2-methylphenol	ND< 1.46E-04	ND< 1.42E-04	ND< 1.48E-04
n-Nitrosodiphenylamine	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
4-Bromophenyl-phenyl ether	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Hexachlorobenzene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Pentachlorophenol	3.03E-07 J	1.38E-06 J	ND< 1.48E-04
Phenanthrene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Anthracene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Di-n-butylphthalate	5.06E-07 J	ND< 2.97E-05	ND< 3.09E-05
Fluoranthene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Pyrene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Butylbenzylphthalate	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
3,3'-Dichlorobenzidine	ND< 6.07E-05	ND< 5.94E-05	ND< 6.18E-05
Benzo(a)anthracene	ND< 3.03E-05	2.97E-07 J	ND< 3.09E-05
Chrysene	ND< 3.03E-05	1.98E-07 J	ND< 3.09E-05
bis(2-Ethylhexyl)phthalate	2.33E-06 JB	1.09E-06 JB	1.13E-06 JB
Di-n-octylphthalate	ND< 3.03E-05	1.98E-07 J	ND< 3.09E-05
Benzo(b)fluoranthene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Benzo(k)fluoranthene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Benzo(a)pyrene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Indeno(1,2,3-cd)pyrene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Dibenzo(a,h)anthracene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Benzo(g,h,i)perylene	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Carbazole	ND< 3.03E-05	ND< 2.97E-05	ND< 3.09E-05
Diesel Range Organics (1)	ND< 6.07E-04	NA	NA

"ND<(....)" = Analyte detection limit value.
B=Detected in the field blank in quantities greater than the sample, therefore sample values are not blank corrected.
J=Detected in the samples in quantities less than the calibration detection limit.
(1) Diesel range organics analysis performed on T1 sample only.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location		AFTERBURNER DISCHARGE	
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0121	1405-2038	1410-2045
SAMPLING DATA			
Sampling duration, min.	360.0	360.0	360.0
Nozzle diameter, in.	0.620	0.620	0.620
Cross sectional nozzle area, sq.ft.	0.002097	0.002097	0.002097
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.83	0.77	0.65
Avg. dry gas meter temp., deg F	49	50	49
Avg. abs. dry gas meter temp., deg. R	509	510	509
Total liquid collected by train, ml	341.1	299.4	252.8
Std. vol. of H_2O vapor coll., cu.ft.	16.1	14.1	11.9
Dry gas meter calibration factor	0.993	0.993	0.993
Sample vol. at meter cond., dcf	176.066	169.257	153.896
Sample vol. at std. cond., dscf (1)	180.526	172.471	160.738
Percent of isokinetic sampling	100.6	102.1	99.5
GAS STREAM COMPOSITION DATA			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
CO, % by volume dry basis	0.0	0.0	0.0
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.40	29.41	29.45
H_2O vapor in gas stream, prop. by vol.	0.082	0.076	0.069
Mole fraction of dry gas	0.918	0.924	0.931
Molecular wt. of wet gas, lb/lb mole	28.5	28.5	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA			
Static pressure, in. H_2O	-0.10	-0.10	-0.10
Static pressure, in. Hg	-0.007	-0.007	-0.007
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1541	1517	1509
Avg. absolute temperature, deg.R	2001	1977	1969
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	16.5	15.3	14.1
Stack/duct cross sectional area, sq.ft.	4.59	4.59	4.59
Avg. gas stream volumetric flow, wacf/min.	4530	4210	3890
Avg. gas stream volumetric flow, dscf/min.	1090	1030	980

(1) Standard conditions = 68 degrees F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA		T1		T2		T3
Test run number		T1		T2		T3
Test location				AFTERBURNER DISCHARGE		
Test date		01-31-96		02-02-96		02-04-96
Test time period		1834-0121		1405-2038		1410-2045
TOXICITY EQUIVALENCY EMISSIONS (I-TEFs/89), ng/dscm						
2,3,7,8-TCDD		7.82E-03		4.09E-03		4.39E-03
1,2,3,7,8-PeCDD		1.56E-02		7.17E-03		1.21E-02
1,2,3,4,7,8-HxCDD		2.54E-03		1.23E-03		1.32E-03
1,2,3,6,7,8-HxCDD		2.93E-03		1.02E-03		1.54E-03
1,2,3,7,8,9-HxCDD		6.45E-03		2.25E-03		3.95E-03
1,2,3,4,6,7,8-HpCDD		2.35E-03		6.96E-04		1.60E-03
Total TCDD		0 (3)		0 (3)		0 (3)
Total PeCDD		0 (3)		0 (3)		0 (3)
Total HxCDD		0 (3)		0 (3)		0 (3)
Total HpCDD		0 (3)		0 (3)		0 (3)
OCDD		6.06E-04		2.25E-04		4.39E-04
2,3,7,8-TCDF	ND<	1.37E-04		2.05E-04		2.20E-04
1,2,3,7,8-PeCDF	ND<	1.96E-04		1.02E-04		2.20E-04
2,3,4,7,8-PeCDF	ND<	1.96E-03		3.07E-03		2.20E-03
1,2,3,4,7,8-HxCDF		3.91E-04		8.19E-04		1.32E-03
1,2,3,6,7,8-HxCDF		1.96E-04		4.09E-04		6.59E-04
2,3,4,6,7,8-HxCDF		3.91E-04		6.14E-04		6.59E-04
1,2,3,7,8,9-HxCDF	ND<	1.96E-04	ND<	4.09E-04	ND<	2.20E-04
1,2,3,4,6,7,8-HpCDF		9.78E-05		1.64E-04		2.20E-04
1,2,3,4,7,8,9-HpCDF		1.96E-05		2.05E-05		4.39E-05
Total TCDF		0 (3)		0 (3)		0 (3)
Total PeCDF		0 (3)		0 (3)		0 (3)
Total HxCDF		0 (3)		0 (3)		0 (3)
Total HpCDF		0 (3)		0 (3)		0 (3)
OCDF		1.56E-05		1.02E-05		1.10E-05
TOTAL 2,3,7,8-TCDD EQUIVALENTS, ng/dscm (1)	≤	4.20E-02	≤	2.25E-02	≤	3.11E-02
DETECTED TOXICITY EQUIVALENCY EMISSIONS (I-TEFs/89), ng/dscm						
2,3,7,8-TCDD		7.82E-03		4.09E-03		4.39E-03
1,2,3,7,8-PeCDD		1.56E-02		7.17E-03		1.21E-02
1,2,3,4,7,8-HxCDD		2.54E-03		1.23E-03		1.32E-03
1,2,3,6,7,8-HxCDD		2.93E-03		1.02E-03		1.54E-03
1,2,3,7,8,9-HxCDD		6.45E-03		2.25E-03		3.95E-03
1,2,3,4,6,7,8-HpCDD		2.35E-03		6.96E-04		1.60E-03
OCDD		6.06E-04		2.25E-04		4.39E-04
2,3,7,8-TCDF		ND		2.05E-04		2.20E-04
1,2,3,7,8-PeCDF		ND		1.02E-04		2.20E-04
2,3,4,7,8-PeCDF		ND		3.07E-03		2.20E-03
1,2,3,4,7,8-HxCDF		3.91E-04		8.19E-04		1.32E-03
1,2,3,6,7,8-HxCDF		1.96E-04		4.09E-04		6.59E-04
2,3,4,6,7,8-HxCDF		3.91E-04		6.14E-04		6.59E-04
1,2,3,7,8,9-HxCDF		ND		ND		ND
1,2,3,4,6,7,8-HpCDF		9.78E-05		1.64E-04		2.20E-04
1,2,3,4,7,8,9-HpCDF		1.96E-05		2.05E-05		4.39E-05
OCDF		1.56E-05		1.02E-05		1.10E-05
DETECTED TOTAL 2,3,7,8-TCDD EQUIVALENTS, ng/dscm(2)		3.95E-02		2.21E-02		3.09E-02

(1) Calculated Total 2,3,7,8-TCDD equivalents based on all detected and non-detected values.
(2) Calculated Total 2,3,7,8-TCDD equivalents based on detected values only.
(3) Zero value denotes no toxic equivalency.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA		T1		T2		T3
Test run number		T1		T2		T3
Test location				AFTERBURNER DISCHARGE		
Test date		01-31-96		02-02-96		02-04-96
Test time period		1834-0121		1405-2038		1410-2045
TOXICITY EQUIVALENCY EMISSIONS (I-TEFs/89), lb/hr						
2,3,7,8-TCDD		3.20E-11		1.58E-11		1.62E-11
1,2,3,7,8-PeCDD		6.39E-11		2.76E-11		4.44E-11
1,2,3,4,7,8-HxCDD		1.04E-11		4.73E-12		4.85E-12
1,2,3,6,7,8-HxCDD		1.20E-11		3.94E-12		5.66E-12
1,2,3,7,8,9-HxCDD		2.64E-11		8.67E-12		1.45E-11
1,2,3,4,6,7,8-HpCDD		9.59E-12		2.68E-12		5.90E-12
Total TCDD		0 (3)		0 (3)		0 (3)
Total PeCDD		0 (3)		0 (3)		0 (3)
Total HxCDD		0 (3)		0 (3)		0 (3)
Total HpCDD		0 (3)		0 (3)		0 (3)
OCDD		2.48E-12		8.67E-13		1.62E-12
2,3,7,8-TCDF	ND<	5.59E-13		7.88E-13		8.08E-13
1,2,3,7,8-PeCDF	ND<	7.99E-13		3.94E-13		8.08E-13
2,3,4,7,8-PeCDF	ND<	7.99E-12		1.18E-11		8.08E-12
1,2,3,4,7,8-HxCDF		1.60E-12		3.15E-12		4.85E-12
1,2,3,6,7,8-HxCDF		7.99E-13		1.58E-12		2.42E-12
2,3,4,6,7,8-HxCDF		1.60E-12		2.36E-12		2.42E-12
1,2,3,7,8,9-HxCDF	ND<	7.99E-13	ND<	1.58E-12	ND<	8.08E-13
1,2,3,4,6,7,8-HpCDF		3.99E-13		6.30E-13		8.08E-13
1,2,3,4,7,8,9-HpCDF		7.99E-14		7.88E-14		1.62E-13
Total TCDF		0 (3)		0 (3)		0 (3)
Total PeCDF		0 (3)		0 (3)		0 (3)
Total HxCDF		0 (3)		0 (3)		0 (3)
Total HpCDF		0 (3)		0 (3)		0 (3)
OCDF		6.39E-14		3.94E-14		4.04E-14
TOTAL 2,3,7,8-TCDD EQUIVALENTS, lb/hr (1)	≤	1.71E-10	≤	8.66E-11	≤	1.14E-10

DETECTED TOXICITY EQUIVALENCY EMISSIONS (I-TEFs/89), lb/hr	T1	T2	T3
2,3,7,8-TCDD	3.20E-11	1.58E-11	1.62E-11
1,2,3,7,8-PeCDD	6.39E-11	2.76E-11	4.44E-11
1,2,3,4,7,8-HxCDD	1.04E-11	4.73E-12	4.85E-12
1,2,3,6,7,8-HxCDD	1.20E-11	3.94E-12	5.66E-12
1,2,3,7,8,9-HxCDD	2.64E-11	8.67E-12	1.45E-11
1,2,3,4,6,7,8-HpCDD	9.59E-12	2.68E-12	5.90E-12
OCDD	2.48E-12	8.67E-13	1.62E-12
2,3,7,8-TCDF	ND	7.88E-13	8.08E-13
1,2,3,7,8-PeCDF	ND	3.94E-13	8.08E-13
2,3,4,7,8-PeCDF	ND	1.18E-11	8.08E-12
1,2,3,4,7,8-HxCDF	1.60E-12	3.15E-12	4.85E-12
1,2,3,6,7,8-HxCDF	7.99E-13	1.58E-12	2.42E-12
2,3,4,6,7,8-HxCDF	1.60E-12	2.36E-12	2.42E-12
1,2,3,7,8,9-HxCDF	ND	ND	ND
1,2,3,4,6,7,8-HpCDF	3.99E-13	6.30E-13	8.08E-13
1,2,3,4,7,8,9-HpCDF	7.99E-14	7.88E-14	1.62E-13
OCDF	6.39E-14	3.94E-14	4.04E-14
DETECTED TOTAL 2,3,7,8-TCDD EQUIVALENTS, lb/hr (2)	1.61E-10	8.50E-11	1.14E-10

(1) Calculated Total 2,3,7,8-TCDD equivalents based on all detected and non-detected values.
(2) Calculated Total 2,3,7,8-TCDD equivalents based on detected values only.
(3) Zero value denotes no toxic equivalency.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA				
Test run number		T1	T2	T3
Test location			AFTERBURNER DISCHARGE	
Test date		01-31-96	02-02-96	02-04-96
Test time period		1834-0121	1405-2038	1410-2045
DIOXIN LABORATORY REPORT DATA, ng				
2,3,7,8-TCDD		0.040	0.020	0.020
1,2,3,7,8-PeCDD		0.160	0.070	0.110
1,2,3,4,7,8-HxCDD		0.130	0.060	0.060
1,2,3,6,7,8-HxCDD		0.150	0.050	0.070
1,2,3,7,8,9-HxCDD		0.330	0.110	0.180
1,2,3,4,6,7,8-HpCDD		1.200	0.340	0.730
Total TCDD		0.840	0.360	0.260
Total PeCDD		1.900	0.790	1.300
Total HxCDD		2.600	0.960	1.400
Total HpCDD		2.800	0.750	1.900
OCDD		3.100	1.100	2.000
Total PCDD		11.240	3.960	6.860
DIOXIN CONCENTRATION, ppb/v	mole wt.			
2,3,7,8-TCDD	321.9744	5.85E-07	3.06E-07	3.28E-07
1,2,3,7,8-PeCDD	356.4195	2.11E-06	9.67E-07	1.63E-06
1,2,3,4,7,8-HxCDD	390.8646	1.57E-06	7.56E-07	8.11E-07
1,2,3,6,7,8-HxCDD	390.8646	1.81E-06	6.30E-07	9.47E-07
1,2,3,7,8,9-HxCDD	390.8646	3.97E-06	1.39E-06	2.43E-06
1,2,3,4,6,7,8-HpCDD	425.3097	1.33E-05	3.94E-06	9.07E-06
Total TCDD	321.9744	1.23E-05	5.51E-06	4.27E-06
Total PeCDD	356.4195	2.51E-05	1.09E-05	1.93E-05
Total HxCDD	390.8646	3.13E-05	1.21E-05	1.89E-05
Total HpCDD	425.3097	3.10E-05	8.69E-06	2.36E-05
OCDD	459.7548	3.17E-05	1.18E-05	2.30E-05
Total PCDD	321.9744	1.64E-04	6.06E-05	1.13E-04
DIOXIN EMISSIONS, lb/dscf				
2,3,7,8-TCDD		4.88E-16	2.56E-16	2.74E-16
1,2,3,7,8-PeCDD		1.95E-15	8.95E-16	1.51E-15
1,2,3,4,7,8-HxCDD		1.59E-15	7.67E-16	8.23E-16
1,2,3,6,7,8-HxCDD		1.83E-15	6.39E-16	9.60E-16
1,2,3,7,8,9-HxCDD		4.03E-15	1.41E-15	2.47E-15
1,2,3,4,6,7,8-HpCDD		1.47E-14	4.35E-15	1.00E-14
Total TCDD		1.03E-14	4.60E-15	3.57E-15
Total PeCDD		2.32E-14	1.01E-14	1.78E-14
Total HxCDD		3.18E-14	1.23E-14	1.92E-14
Total HpCDD		3.42E-14	9.59E-15	2.61E-14
OCDD		3.79E-14	1.41E-14	2.74E-14
Total PCDD		1.37E-13	5.06E-14	9.41E-14

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0121	1405-2038	1410-2045
DIOXIN CONCENTRATION, ng/dscm			
2,3,7,8-TCDD	7.82E-03	4.09E-03	4.39E-03
1,2,3,7,8-PeCDD	3.13E-02	1.43E-02	2.42E-02
1,2,3,4,7,8-HxCDD	2.54E-02	1.23E-02	1.32E-02
1,2,3,6,7,8-HxCDD	2.93E-02	1.02E-02	1.54E-02
1,2,3,7,8,9-HxCDD	6.45E-02	2.25E-02	3.95E-02
1,2,3,4,6,7,8-HpCDD	2.35E-01	6.96E-02	1.60E-01
Total TCDD	1.64E-01	7.37E-02	5.71E-02
Total PeCDD	3.72E-01	1.62E-01	2.86E-01
Total HxCDD	5.09E-01	1.97E-01	3.08E-01
Total HpCDD	5.48E-01	1.54E-01	4.17E-01
OCDD	6.06E-01	2.25E-01	4.39E-01
Total PCDD	2.20E+00	8.11E-01	1.51E+00
DIOXIN EMISSIONS, lb/hr			
2,3,7,8-TCDD	3.20E-11	1.58E-11	1.62E-11
1,2,3,7,8-PeCDD	1.28E-10	5.52E-11	8.89E-11
1,2,3,4,7,8-HxCDD	1.04E-10	4.73E-11	4.85E-11
1,2,3,6,7,8-HxCDD	1.20E-10	3.94E-11	5.66E-11
1,2,3,7,8,9-HxCDD	2.64E-10	8.67E-11	1.45E-10
1,2,3,4,6,7,8-HpCDD	9.59E-10	2.68E-10	5.90E-10
Total TCDD	6.71E-10	2.84E-10	2.10E-10
Total PeCDD	1.52E-09	6.22E-10	1.05E-09
Total HxCDD	2.08E-09	7.56E-10	1.13E-09
Total HpCDD	2.24E-09	5.91E-10	1.54E-09
OCDD	2.48E-09	8.67E-10	1.62E-09
Total PCDD	8.98E-09	3.12E-09	5.54E-09

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA		T1	T2	T3
Test run number		T1	T2	T3
Test location			AFTERBURNER DISCHARGE	
Test date		01-31-96	02-02-96	02-04-96
Test time period		1834-0121	1405-2038	1410-2045

FURAN LABORATORY REPORT DATA, ng		T1	T2	T3
2,3,7,8-TCDF		ND< 0.007	0.010	0.010
1,2,3,7,8-PeCDF		ND< 0.020	0.010	0.020
2,3,4,7,8-PeCDF		ND< 0.020	0.030	0.020
1,2,3,4,7,8-HxCDF		0.020	0.040	0.060
1,2,3,6,7,8-HxCDF		0.010	0.020	0.030
2,3,4,6,7,8-HxCDF		0.020	0.030	0.030
1,2,3,7,8,9-HxCDF		ND< 0.010	ND< 0.020	ND< 0.010
1,2,3,4,6,7,8-HpCDF		0.050	0.080	0.100
1,2,3,4,7,8,9-HpCDF		0.010	0.010	0.020
Total TCDF		0.040	0.140	0.350
Total PeCDF		0.130	0.280	0.320
Total HxCDF		0.160	0.200	0.280
Total HpCDF		0.130	0.160	0.180
OCDF		0.080	0.050	0.050
Total PCDF		0.540	0.830	1.180

FURAN CONCENTRATION, ppb/v	mole wt	T1	T2	T3
2,3,7,8-TCDF	305.9750	ND< 1.08E-07	1.61E-07	1.73E-07
1,2,3,7,8-PeCDF	340.4201	ND< 2.76E-07	1.45E-07	3.11E-07
2,3,4,7,8-PeCDF	340.4201	ND< 2.76E-07	4.34E-07	3.11E-07
1,2,3,4,7,8-HxCDF	374.8652	2.51E-07	5.26E-07	8.46E-07
1,2,3,6,7,8-HxCDF	374.8652	1.26E-07	2.63E-07	4.23E-07
2,3,4,6,7,8-HxCDF	374.8652	2.51E-07	3.94E-07	4.23E-07
1,2,3,7,8,9-HxCDF	374.8652	ND< 1.26E-07	ND< 2.63E-07	ND< 1.41E-07
1,2,3,4,6,7,8-HpCDF	409.3103	5.75E-07	9.63E-07	1.29E-06
1,2,3,4,7,8,9-HpCDF	409.3103	1.15E-07	1.20E-07	2.58E-07
Total TCDF	305.9750	6.15E-07	2.25E-06	6.05E-06
Total PeCDF	340.4201	1.80E-06	4.05E-06	4.97E-06
Total HxCDF	374.8652	2.01E-06	2.63E-06	3.95E-06
Total HpCDF	409.3103	1.49E-06	1.93E-06	2.32E-06
OCDF	443.7554	8.48E-07	5.55E-07	5.96E-07
Total PCDF	305.9750	8.31E-06	1.34E-05	2.04E-05

FURAN EMISSIONS, lb/dscf		T1	T2	T3
2,3,7,8-TCDF		ND< 8.55E-17	1.28E-16	1.37E-16
1,2,3,7,8-PeCDF		ND< 2.44E-16	1.28E-16	2.74E-16
2,3,4,7,8-PeCDF		ND< 2.44E-16	3.83E-16	2.74E-16
1,2,3,4,7,8-HxCDF		2.44E-16	5.11E-16	8.23E-16
1,2,3,6,7,8-HxCDF		1.22E-16	2.56E-16	4.11E-16
2,3,4,6,7,8-HxCDF		2.44E-16	3.83E-16	4.11E-16
1,2,3,7,8,9-HxCDF		ND< 1.22E-16	ND< 2.56E-16	ND< 1.37E-16
1,2,3,4,6,7,8-HpCDF		6.11E-16	1.02E-15	1.37E-15
1,2,3,4,7,8,9-HpCDF		1.22E-16	1.28E-16	2.74E-16
Total TCDF		4.88E-16	1.79E-15	4.80E-15
Total PeCDF		1.59E-15	3.58E-15	4.39E-15
Total HxCDF		1.95E-15	2.56E-15	3.84E-15
Total HpCDF		1.59E-15	2.05E-15	2.47E-15
OCDF		9.77E-16	6.39E-16	6.86E-16
Total PCDF		6.59E-15	1.06E-14	1.62E-14

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF DIOXIN AND FURAN TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location		AFTERBURNER DISCHARGE	
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0121	1405-2038	1410-2045
FURAN CONCENTRATIONS, ng/dscm			
2,3,7,8-TCDF	ND< 1.37E-03	2.05E-03	2.20E-03
1,2,3,7,8-PeCDF	ND< 3.91E-03	2.05E-03	4.39E-03
2,3,4,7,8-PeCDF	ND< 3.91E-03	6.14E-03	4.39E-03
1,2,3,4,7,8-HxCDF	3.91E-03	8.19E-03	1.32E-02
1,2,3,6,7,8-HxCDF	1.96E-03	4.09E-03	6.59E-03
2,3,4,6,7,8-HxCDF	3.91E-03	6.14E-03	6.59E-03
1,2,3,7,8,9-HxCDF	ND< 1.96E-03	ND< 4.09E-03	ND< 2.20E-03
1,2,3,4,6,7,8-HpCDF	9.78E-03	1.64E-02	2.20E-02
1,2,3,4,7,8,9-HpCDF	1.96E-03	2.05E-03	4.39E-03
Total TCDF	7.82E-03	2.87E-02	7.69E-02
Total PeCDF	2.54E-02	5.73E-02	7.03E-02
Total HxCDF	3.13E-02	4.09E-02	6.15E-02
Total HpCDF	2.54E-02	3.28E-02	3.95E-02
OCDF	1.56E-02	1.02E-02	1.10E-02
Total PCDF	1.06E-01	1.70E-01	2.59E-01
FURAN EMISSIONS, lb/hr			
2,3,7,8-TCDF	ND< 5.59E-12	7.88E-12	8.08E-12
1,2,3,7,8-PeCDF	ND< 1.60E-11	7.88E-12	1.62E-11
2,3,4,7,8-PeCDF	ND< 1.60E-11	2.36E-11	1.62E-11
1,2,3,4,7,8-HxCDF	1.60E-11	3.15E-11	4.85E-11
1,2,3,6,7,8-HxCDF	7.99E-12	1.58E-11	2.42E-11
2,3,4,6,7,8-HxCDF	1.60E-11	2.36E-11	2.42E-11
1,2,3,7,8,9-HxCDF	ND< 7.99E-12	ND< 1.58E-11	ND< 8.08E-12
1,2,3,4,6,7,8-HpCDF	3.99E-11	6.30E-11	8.08E-11
1,2,3,4,7,8,9-HpCDF	7.99E-12	7.88E-12	1.62E-11
Total TCDF	3.20E-11	1.10E-10	2.83E-10
Total PeCDF	1.04E-10	2.21E-10	2.59E-10
Total HxCDF	1.28E-10	1.58E-10	2.26E-10
Total HpCDF	1.04E-10	1.26E-10	1.45E-10
OCDF	6.39E-11	3.94E-11	4.04E-11
Total PCDF	4.31E-10	6.54E-10	9.53E-10

TOXICITY EQUIVALENCY FACTORS (I-TEFs/89)

2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PeCDD	0.5	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01
Total TCDD	0	0	0
Total PeCDD	0	0	0
Total HxCDD	0	0	0
Total HpCDD	0	0	0
OCDD	0.001	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.05	0.05
2,3,4,7,8-PeCDF	0.5	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
Total TCDF	0	0	0
Total PeCDF	0	0	0
Total HxCDF	0	0	0
Total HpCDF	0	0	0
OCDF	0.001	0.001	0.001

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

	M.W.								
TEST DATA:									
Test run number		1		1		1		1	
Test location		OUTLET		OUTLET		OUTLET		OUTLET	
Test date		01-31-96		01-31-96		01-31-96		01-31-96	
Test time		1846-1926		2052-2132		2153-2233		2242-2322	
Test tube pair		1		3		4		5	
SAMPLING DATA:									
Duration, minutes		40.00		40.00		40.00		40.00	
Average dry gas meter press. in. H_2O		1.39		1.40		1.40		1.30	
Average dry gas meter temp. deg. C		9.81		11.12		11.00		11.00	
Average dry gas meter temp. deg. F		49.66		52.02		51.80		51.80	
Average absolute meter temp. deg. R		509.66		512.02		511.80		511.80	
Actual sample volume, liters		21.440		22.693		21.385		20.763	
Meter box calibration, Y		1.0060		1.0060		1.0060		1.0060	
Barometric pressure, in. Hg		29.73		29.73		29.73		29.73	
Sample volume, dscf		0.7865		0.8287		0.7812		0.7583	
Volumetric flow rate, dscf/min (1)		1000		1000		1000		1000	
LABORATORY DATA, ng:	**M.W.**								
Chloromethane (Methyl Chloride)	50.49	1000.000		2200.000	E	5500.000	E	3900.000	E
Bromomethane (Methyl Bromide)	94.95	81.000	JB	530.000		120.000		400.000	
Vinyl Chloride	62.50	100.000	U	100.000	U	100.000	U	100.000	U
Chloroethane (Ethyl Chloride)	64.52	100.000	U	100.000	U	100.000	U	100.000	U
Methylene chloride	84.93	99.463	JB	86.257	JB	68.239	JB	57.264	JB
Acetone	58.09	24667.707	E	1682.057		2265.912		2568.114	
Carbon Disulfide	76.13	50.000	U	50.000	U	50.000	U	50.000	U
1,1-Dichloroethene	96.94	50.000	U	50.000	U	50.000	U	50.000	U
1,1-Dichloroethane	98.96	50.000	U	50.000	U	50.000	U	50.000	U
1,2-Dichloroethene (trans)	96.94	50.000	U	50.000	U	50.000	U	50.000	U
Chloroform	119.37	20.078	J	21.154	J	19.943	J	19.359	J
1,2-Dichloroethane (EDC)	98.96	50.000	U	50.000	U	50.000	U	50.000	U
2-Butanone (MEK)	72.12	1000.000	U	1000.000	U	1000.000	U	1000.000	U
1,1,1-Trichloroethane (TCA)	133.40	50.000	U	50.000	U	50.000	U	50.000	U
Carbon Tetrachloride	153.81	50.000	U	50.000	U	50.000	U	50.000	U
Vinyl acetate	86.09	200.000	U	200.000	U	200.000	U	200.000	U
Bromodichloromethane	163.83	50.000	U	50.000	U	50.000	U	50.000	U
1,2-Dichloropropane	112.99	50.000	U	50.000	U	50.000	U	50.000	U
cis-1,3-Dichloropropene	110.98	50.000	U	50.000	U	50.000	U	50.000	U
Trichloroethene (TCE)	131.38	50.000	U	50.000	U	50.000	U	50.000	U
Dibromochloromethane	208.29	50.000	U	50.000	U	50.000	U	50.000	U
1,1,2-Trichloroethane	133.40	50.000	U	50.000	U	50.000	U	50.000	U
Benzene	78.12	99.000	JB	46.000	JB	68.000	JB	67.000	JB
trans-1,3-Dichloropropene	110.98	50.000	U	50.000	U	50.000	U	50.000	U
Bromoform	252.75	50.000	U	50.000	U	50.000	U	50.000	U
4-Methyl-2-Pentanone (MIBK)	100.18	1000.000	U	1000.000	U	1000.000	U	1000.000	U
2-Hexanone	100.18	1000.000	U	1000.000	U	1000.000	U	1000.000	U
Tetrachloroethene (PCE)	165.82	50.000	U	50.000	U	50.000	U	50.000	U
1,1,2,2-Tetrachloroethane	167.84	50.000	U	50.000	U	50.000	U	50.000	U
Toluene	92.15	50.000	JB	32.000	JB	44.000	JB	35.000	JB
Chlorobenzene	112.56	50.000	U	50.000	U	50.000	U	50.000	U
Ethylbenzene	106.18	50.000	U	50.000	U	50.000	U	50.000	U
Styrene	104.16	17.000	J	6.000	J	12.000	J	9.000	J
Xylenes (total)	106.18	38.000		13.000	J	28.000		29.000	J
2-Chloroethyl vinyl ether	106.55	200.000	U	200.000	U	200.000	U	200.000	U

U = detection limit value.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
B = Compound also detected in blank. Reported values are not blank corrected.
(1) Volumetric flow rate based on average of Particulate/HCl and MMTL tests flow measurements.
NOTE: Data from test tube pairs 2 and 6 not available due to instrument failure during analysis.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:					
Test run number	1	1	1	1	1
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	01-31-96	01-31-96	01-31-96	01-31-96	
Test time	1846-1926	2052-2132	2153-2233	2242-2322	
Test tube pair	1	3	4	5	AVERAGE (2)
VOST EMISSIONS (lbs/dscf):					
Chloromethane (Methyl Chloride)	2.80E-09	5.85E-09 E	1.55E-08 E	1.13E-08 E	8.88E-09
Bromomethane (Methyl Bromide)	2.27E-10 JB	1.41E-09	3.39E-10	1.16E-09	7.85E-10
Vinyl Chloride	< 2.80E-10	< 2.66E-10	< 2.82E-10	< 2.91E-10	< 2.80E-10
Chloroethane (Ethyl Chloride)	< 2.80E-10	< 2.66E-10	< 2.82E-10	< 2.91E-10	< 2.80E-10
Methylene chloride	2.79E-10 JB	2.29E-10 JB	1.93E-10 JB	1.66E-10 JB	2.17E-10
Acetone	6.91E-08 E	4.48E-09	6.39E-09	7.47E-09	2.19E-08
Carbon Disulfide	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,1-Dichloroethene	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,1-Dichloroethane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,2-Dichloroethene (trans)	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Chloroform	5.63E-11 J	5.63E-11 J	5.63E-11 J	5.63E-11 J	5.63E-11
1,2-Dichloroethane (EDC)	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
2-Butanone (MEK)	< 2.80E-09	< 2.66E-09	< 2.82E-09	< 2.91E-09	< 2.80E-09
1,1,1-Trichloroethane (TCA)	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Carbon Tetrachloride	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Vinyl acetate	< 5.61E-10	< 5.32E-10	< 5.64E-10	< 5.81E-10	< 5.60E-10
Bromodichloromethane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,2-Dichloropropane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
cis-1,3-Dichloropropene	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Trichloroethene (TCE)	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Dibromochloromethane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,1,2-Trichloroethane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Benzene	2.78E-10 JB	1.22E-10 JB	1.92E-10 JB	1.95E-10 JB	1.97E-10
trans-1,3-Dichloropropene	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Bromoform	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
4-Methyl-2-Pentanone (MIBK)	< 2.80E-09	< 2.66E-09	< 2.82E-09	< 2.91E-09	< 2.80E-09
2-Hexanone	< 2.80E-09	< 2.66E-09	< 2.82E-09	< 2.91E-09	< 2.80E-09
Tetrachloroethene (PCE)	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
1,1,2,2-Tetrachloroethane	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Toluene	1.40E-10 JB	8.51E-11 JB	1.24E-10 JB	1.02E-10 JB	1.13E-10
Chlorobenzene	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Ethylbenzene	< 1.40E-10	< 1.33E-10	< 1.41E-10	< 1.45E-10	< 1.40E-10
Styrene	4.77E-11 J	1.60E-11 J	3.39E-11 J	2.62E-11 J	3.09E-11
Xylenes (total)	1.07E-10	3.46E-11 J	7.90E-11	8.43E-11 J	7.61E-11
2-Chloroethyl vinyl ether	< 5.61E-10	< 5.32E-10	< 5.64E-10	< 5.81E-10	< 5.60E-10

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:					
Test run number	1	1	1	1	1
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	01-31-96	01-31-96	01-31-96	01-31-96	
Test time	1846-1926	2052-2132	2153-2233	2242-2322	
Test tube pair	1	3	4	5	AVERAGE (2)
VOST EMISSIONS (ug/dscm):					
Chloromethane (Methyl Chloride)	4.49E+01	9.37E+01 E	2.49E+02 E	1.82E+02 E	1.42E+02
Bromomethane (Methyl Bromide)	3.64E+00 JB	2.26E+01	5.42E+00	1.86E+01	1.26E+01
Vinyl Chloride	< 4.49E+00	< 4.26E+00	< 4.52E+00	< 4.66E+00	< 4.48E+00
Chloroethane (Ethyl Chloride)	< 4.49E+00	< 4.26E+00	< 4.52E+00	< 4.66E+00	< 4.48E+00
Methylene chloride	4.47E+00 JB	3.68E+00 JB	3.08E+00 JB	2.67E+00 JB	3.47E+00
Acetone	1.11E+03 E	7.17E+01	1.02E+02	1.20E+02	3.50E+02
Carbon Disulfide	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,1-Dichloroethene	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,1-Dichloroethane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,2-Dichloroethene (trans)	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Chloroform	9.01E-01 J	9.01E-01 J	9.01E-01 J	9.01E-01 J	9.01E-01
1,2-Dichloroethane (EDC)	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
2-Butanone (MEK)	< 4.49E+01	< 4.26E+01	< 4.52E+01	< 4.66E+01	< 4.48E+01
1,1,1-Trichloroethane (TCA)	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Carbon Tetrachloride	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Vinyl acetate	< 8.98E+00	< 8.52E+00	< 9.04E+00	< 9.31E+00	< 8.96E+00
Bromodichloromethane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,2-Dichloropropane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
cis-1,3-Dichloropropene	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Trichloroethene (TCE)	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Dibromochloromethane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,1,2-Trichloroethane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Benzene	4.44E+00 JB	1.96E+00 JB	3.07E+00 JB	3.12E+00 JB	3.15E+00
trans-1,3-Dichloropropene	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Bromoform	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
4-Methyl-2-Pentanone (MIBK)	< 4.49E+01	< 4.26E+01	< 4.52E+01	< 4.66E+01	< 4.48E+01
2-Hexanone	< 4.49E+01	< 4.26E+01	< 4.52E+01	< 4.66E+01	< 4.48E+01
Tetrachloroethene (PCE)	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
1,1,2,2-Tetrachloroethane	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Toluene	2.24E+00 JB	1.36E+00 JB	1.99E+00 JB	1.63E+00 JB	1.81E+00
Chlorobenzene	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Ethylbenzene	< 2.24E+00	< 2.13E+00	< 2.26E+00	< 2.33E+00	< 2.24E+00
Styrene	7.63E-01 J	2.56E-01 J	5.42E-01 J	4.19E-01 J	4.95E-01
Xylenes (total)	1.71E+00	5.54E-01 J	1.27E+00	1.35E+00 J	1.22E+00
2-Chloroethyl vinyl ether	< 8.98E+00	< 8.52E+00	< 9.04E+00	< 9.31E+00	< 8.96E+00

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:										
Test run number		1		1		1		1		1
Test location		OUTLET		OUTLET		OUTLET		OUTLET		OUTLET
Test date		01-31-96		01-31-96		01-31-96		01-31-96		
Test time		1846-1926		2052-2132		2153-2233		2242-2322		
Test tube pair		1		3		4		5		AVERAGE (2)
VOST EMISSIONS (ppm/v):										
Chloromethane (Methyl Chloride)		2.14E-02		4.47E-02 E		1.18E-01 E		8.65E-02 E		6.78E-02
Bromomethane (Methyl Bromide)		9.21E-04 JB		5.72E-03		1.37E-03		4.72E-03		3.18E-03
Vinyl Chloride	<	1.73E-03	<	1.64E-03	<	1.74E-03	<	1.79E-03	<	1.73E-03
Chloroethane (Ethyl Chloride)	<	1.67E-03	<	1.59E-03	<	1.69E-03	<	1.74E-03	<	1.67E-03
Methylene chloride		1.27E-03 JB		1.04E-03 JB		8.74E-04 JB		7.55E-04 JB		9.84E-04
Acetone		4.59E-01 E		2.97E-02		4.24E-02		4.95E-02		1.45E-01
Carbon Disulfide	<	7.09E-04	<	6.73E-04	<	7.14E-04	<	7.36E-04	<	7.08E-04
1,1-Dichloroethene	<	5.57E-04	<	5.29E-04	<	5.61E-04	<	5.78E-04	<	5.56E-04
1,1-Dichloroethane	<	5.46E-04	<	5.18E-04	<	5.49E-04	<	5.66E-04	<	5.45E-04
1,2-Dichloroethene (trans)	<	5.57E-04	<	5.29E-04	<	5.61E-04	<	5.78E-04	<	5.56E-04
Chloroform		1.82E-04 J		1.82E-04 J		1.82E-04 J		1.82E-04 J		1.82E-04
1,2-Dichloroethane (EDC)	<	5.46E-04	<	5.18E-04	<	5.49E-04	<	5.66E-04	<	5.45E-04
2-Butanone (MEK)	<	1.50E-02	<	1.42E-02	<	1.51E-02	<	1.55E-02	<	1.50E-02
1,1,1-Trichloroethane (TCA)	<	4.05E-04	<	3.84E-04	<	4.08E-04	<	4.20E-04	<	4.04E-04
Carbon Tetrachloride	<	3.51E-04	<	3.33E-04	<	3.54E-04	<	3.64E-04	<	3.51E-04
Vinyl acetate	<	2.51E-03	<	2.38E-03	<	2.53E-03	<	2.60E-03	<	2.51E-03
Bromodichloromethane	<	3.30E-04	<	3.13E-04	<	3.32E-04	<	3.42E-04	<	3.29E-04
1,2-Dichloropropane	<	4.78E-04	<	4.54E-04	<	4.81E-04	<	4.96E-04	<	4.77E-04
cis-1,3-Dichloropropene	<	4.87E-04	<	4.62E-04	<	4.90E-04	<	5.05E-04	<	4.86E-04
Trichloroethene (TCE)	<	4.11E-04	<	3.90E-04	<	4.14E-04	<	4.26E-04	<	4.10E-04
Dibromochloromethane	<	2.59E-04	<	2.46E-04	<	2.61E-04	<	2.69E-04	<	2.59E-04
1,1,2-Trichloroethane	<	4.05E-04	<	3.84E-04	<	4.08E-04	<	4.20E-04	<	4.04E-04
Benzene		1.37E-03 JB		6.04E-04 JB		9.47E-04 JB		9.61E-04 JB		9.70E-04
trans-1,3-Dichloropropene	<	4.87E-04	<	4.62E-04	<	4.90E-04	<	5.05E-04	<	4.86E-04
Bromoform	<	2.14E-04	<	2.03E-04	<	2.15E-04	<	2.22E-04	<	2.13E-04
4-Methyl-2-Pentanone (MIBK)	<	1.08E-02	<	1.02E-02	<	1.09E-02	<	1.12E-02	<	1.08E-02
2-Hexanone	<	1.08E-02	<	1.02E-02	<	1.09E-02	<	1.12E-02	<	1.08E-02
Tetrachloroethene (PCE)	<	3.26E-04	<	3.09E-04	<	3.28E-04	<	3.38E-04	<	3.25E-04
1,1,2,2-Tetrachloroethane	<	3.22E-04	<	3.05E-04	<	3.24E-04	<	3.34E-04	<	3.21E-04
Toluene		5.86E-04 JB		3.56E-04 JB		5.19E-04 JB		4.26E-04 JB		4.72E-04
Chlorobenzene	<	4.80E-04	<	4.55E-04	<	4.83E-04	<	4.98E-04	<	4.79E-04
Ethylbenzene	<	5.09E-04	<	4.83E-04	<	5.12E-04	<	5.28E-04	<	5.08E-04
Styrene		1.76E-04 J		5.91E-05 J		1.25E-04 J		9.68E-05 J		1.14E-04
Xylenes (total)		3.87E-04		1.26E-04 J		2.87E-04		3.06E-04 J		2.76E-04
2-Chloroethyl vinyl ether	<	2.03E-03	<	1.92E-03	<	2.04E-03	<	2.10E-03	<	2.02E-03

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:					
Test run number	1	1	1	1	1
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	01-31-96	01-31-96	01-31-96	01-31-96	
Test time	1846-1926	2052-2132	2153-2233	2242-2322	
Test tube pair	1	3	4	5	AVERAGE (2)
VOST EMISSIONS (lb/hr):					
Chloromethane (Methyl Chloride)	1.68E-04	3.51E-04 E	9.31E-04 E	6.80E-04 E	5.33E-04
Bromomethane (Methyl Bromide)	1.36E-05 JB	8.46E-05	2.03E-05	6.98E-05	4.71E-05
Vinyl Chloride	< 1.68E-05	< 1.60E-05	< 1.69E-05	< 1.74E-05	< 1.68E-05
Chloroethane (Ethyl Chloride)	< 1.68E-05	< 1.60E-05	< 1.69E-05	< 1.74E-05	< 1.68E-05
Methylene chloride	1.67E-05 JB	1.38E-05 JB	1.16E-05 JB	9.99E-06 JB	1.30E-05
Acetone	4.15E-03 E	2.69E-04	3.84E-04	4.48E-04	1.31E-03
Carbon Disulfide	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,1-Dichloroethene	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,1-Dichloroethane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,2-Dichloroethene (trans)	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Chloroform	3.38E-06 J	3.38E-06 J	3.38E-06 J	3.38E-06 J	3.38E-06
1,2-Dichloroethane (EDC)	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
2-Butanone (MEK)	< 1.68E-04	< 1.60E-04	< 1.69E-04	< 1.74E-04	< 1.68E-04
1,1,1-Trichloroethane (TCA)	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Carbon Tetrachloride	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Vinyl acetate	< 3.36E-05	< 3.19E-05	< 3.39E-05	< 3.49E-05	< 3.36E-05
Bromodichloromethane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,2-Dichloropropane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
cis-1,3-Dichloropropene	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Trichloroethene (TCE)	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Dibromochloromethane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,1,2-Trichloroethane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Benzene	1.67E-05 JB	7.34E-06 JB	1.15E-05 JB	1.17E-05 JB	1.18E-05
trans-1,3-Dichloropropene	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Bromoform	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
4-Methyl-2-Pentanone (MIBK)	< 1.68E-04	< 1.60E-04	< 1.69E-04	< 1.74E-04	< 1.68E-04
2-Hexanone	< 1.68E-04	< 1.60E-04	< 1.69E-04	< 1.74E-04	< 1.68E-04
Tetrachloroethene (PCE)	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
1,1,2,2-Tetrachloroethane	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Toluene	8.41E-06 JB	5.11E-06 JB	7.45E-06 JB	6.11E-06 JB	6.77E-06
Chlorobenzene	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Ethylbenzene	< 8.41E-06	< 7.98E-06	< 8.47E-06	< 8.72E-06	< 8.39E-06
Styrene	2.86E-06 J	9.58E-07 J	2.03E-06 J	1.57E-06 J	1.85E-06
Xylenes (total)	6.39E-06	2.08E-06 J	4.74E-06	5.06E-06 J	4.57E-06
2-Chloroethyl vinyl ether	< 3.36E-05	< 3.19E-05	< 3.39E-05	< 3.49E-05	< 3.36E-05

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:					
Test run number	1	1	1	1	1
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	01-31-96	01-31-96	01-31-96	01-31-96	
Test time	1846-1926	2052-2132	2153-2233	2242-2322	
Test tube pair	1	3	4	5	AVERAGE (2)
VOST EMISSIONS (g/sec):					
Chloromethane (Methyl Chloride)	2.12E-05	4.42E-05 E	1.17E-04 E	8.57E-05 E	6.71E-05
Bromomethane (Methyl Bromide)	1.72E-06 JB	1.07E-05	2.56E-06	8.79E-06	5.93E-06
Vinyl Chloride	< 2.12E-06	< 2.01E-06	< 2.13E-06	< 2.20E-06	< 2.12E-06
Chloroethane (Ethyl Chloride)	< 2.12E-06	< 2.01E-06	< 2.13E-06	< 2.20E-06	< 2.12E-06
Methylene chloride	2.11E-06 JB	1.73E-06 JB	1.46E-06 JB	1.26E-06 JB	1.64E-06
Acetone	5.23E-04 E	3.38E-05	4.83E-05	5.64E-05	1.65E-04
Carbon Disulfide	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,1-Dichloroethene	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,1-Dichloroethane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,2-Dichloroethene (trans)	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Chloroform	4.25E-07 J	4.25E-07 J	4.25E-07 J	4.25E-07 J	4.25E-07
1,2-Dichloroethane (EDC)	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
2-Butanone (MEK)	< 2.12E-05	< 2.01E-05	< 2.13E-05	< 2.20E-05	< 2.12E-05
1,1,1-Trichloroethane (TCA)	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Carbon Tetrachloride	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Vinyl acetate	< 4.24E-06	< 4.02E-06	< 4.27E-06	< 4.40E-06	< 4.23E-06
Bromodichloromethane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,2-Dichloropropane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
cis-1,3-Dichloropropene	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Trichloroethene (TCE)	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Dibromochloromethane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,1,2-Trichloroethane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Benzene	2.10E-06 JB	9.25E-07 JB	1.45E-06 JB	1.47E-06 JB	1.49E-06
trans-1,3-Dichloropropene	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Bromoform	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
4-Methyl-2-Pentanone (MIBK)	< 2.12E-05	< 2.01E-05	< 2.13E-05	< 2.20E-05	< 2.12E-05
2-Hexanone	< 2.12E-05	< 2.01E-05	< 2.13E-05	< 2.20E-05	< 2.12E-05
Tetrachloroethene (PCE)	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
1,1,2,2-Tetrachloroethane	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Toluene	1.06E-06 JB	6.44E-07 JB	9.39E-07 JB	7.69E-07 JB	8.53E-07
Chlorobenzene	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Ethylbenzene	< 1.06E-06	< 1.01E-06	< 1.07E-06	< 1.10E-06	< 1.06E-06
Styrene	3.60E-07 J	1.21E-07 J	2.56E-07 J	1.98E-07 J	2.34E-07
Xylenes (total)	8.05E-07	2.61E-07 J	5.97E-07	6.37E-07 J	5.75E-07
2-Chloroethyl vinyl ether	< 4.24E-06	< 4.02E-06	< 4.27E-06	< 4.40E-06	< 4.23E-06

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number		2	2	2	2	2	2
Test location		OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date		02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96
Test time		1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005
Test tube pair		1	2	3	4	5	6
SAMPLING DATA:							
Duration, minutes		40.00	40.00	40.00	40.00	40.00	40.00
Average dry gas meter press. in. H_2O		1.40	1.40	1.40	1.40	1.40	1.44
Average dry gas meter temp. deg. C		7.63	9.00	9.44	10.00	10.00	10.00
Average dry gas meter temp. deg. F		45.73	48.20	48.99	50.00	50.00	50.00
Average absolute meter temp. deg. R		505.73	508.20	508.99	510.00	510.00	510.00
Actual sample volume, liters		21.930	21.491	21.148	21.265	21.755	22.222
Meter box calibration, Y		1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
Barometric pressure, in. Hg		29.59	29.59	29.59	29.59	29.59	29.59
Sample volume, dscf		0.8069	0.7869	0.7732	0.7759	0.7938	0.8109
Volumetric flow rate, dscf/min (1)		975	975	975	975	975	975
LABORATORY DATA, ng:	**M.W.**						
Chloromethane (Methyl Chloride)	50.49	260.000	2000.000 E	760.000	390.000	360.000	690.000
Bromomethane (Methyl Bromide)	94.95	68.000	180.000	93.000	85.000	73.000	150.000
Vinyl Chloride	62.50	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U
Chloroethane (Ethyl Chloride)	64.52	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U
Methylene chloride	84.93	52.597 JB	76.260 JB	94.028 JB	90.074 JB	63.376 JB	75.664 JB
Acetone	58.09	3517.553	9312.164	2648.453 J	3579.191 J	3314.012	3518.628
Carbon Disulfide	76.13	8.000 J	50.000 U	50.000 U	7.000 J	9.000 J	10.000 J
1,1-Dichloroethene	96.94	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1-Dichloroethane	98.96	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,2-Dichloroethene (trans)	96.94	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Chloroform	119.37	20.396 J	19.890 J	19.542 J	19.612 J	20.064 J	20.496 J
1,2-Dichloroethane (EDC)	98.96	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
2-Butanone (MEK)	72.12	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
1,1,1-Trichloroethane (TCA)	133.40	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Carbon Tetrachloride	153.81	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Vinyl acetate	86.09	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U
Bromodichloromethane	163.83	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,2-Dichloropropane	112.99	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
cis-1,3-Dichloropropene	110.98	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Trichloroethene (TCE)	131.38	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Dibromochloromethane	208.29	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1,2-Trichloroethane	133.40	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Benzene	78.12	24.000 JB	17.000 JB	10.000 JB	30.000 JB	18.000 JB	20.000 JB
trans-1,3-Dichloropropene	110.98	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Bromoform	252.75	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
4-Methyl-2-Pentanone (MIBK)	100.18	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
2-Hexanone	100.18	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
Tetrachloroethene (PCE)	165.82	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1,2,2-Tetrachloroethane	167.84	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Toluene	92.15	10.000 J	12.000 J	5.000 J	14.000 J	7.000 J	7.000 J
Chlorobenzene	112.56	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Ethylbenzene	106.18	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Styrene	104.16	50.000 U	50.000 U	50.000 U	5.000 J	50.000 U	50.000 U
Xylenes (total)	106.18	6.000 J	5.000 J	50.000 U	8.000 J	50.000 U	50.000 U
2-Chloroethyl vinyl ether	106.55	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U

U = detection limit value.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
B = Compound also detected in blank. Reported values are not blank corrected.
(1) Volumetric flow rate based on average of Particulate/HCl and MMTL tests flow measurements.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	2	2	2	2	2	2	2
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	
Test time	1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (lbs/dscf):							
Chloromethane (Methyl Chloride)	7.10E-10	5.60E-09 E	2.17E-09	1.11E-09	1.00E-09	1.88E-09	2.08E-09
Bromomethane (Methyl Bromide)	1.86E-10	5.04E-10	2.65E-10	2.42E-10	2.03E-10	4.08E-10	3.01E-10
Vinyl Chloride	< 2.73E-10	< 2.80E-10	< 2.85E-10	< 2.84E-10	< 2.78E-10	< 2.72E-10	< 2.79E-10
Chloroethane (Ethyl Chloride)	< 2.73E-10	< 2.80E-10	< 2.85E-10	< 2.84E-10	< 2.78E-10	< 2.72E-10	< 2.79E-10
Methylene chloride	1.44E-10 JB	2.14E-10 JB	2.68E-10 JB	2.56E-10 JB	1.76E-10 JB	2.06E-10 JB	2.11E-10
Acetone	9.61E-09	2.61E-08	7.55E-09 J	1.02E-08 J	9.20E-09	9.57E-09	1.20E-08
Carbon Disulfide	2.19E-11 J	< 1.40E-10	< 1.43E-10	1.99E-11 J	2.50E-11 J	2.72E-11 J	≤ 6.28E-11
1,1-Dichloroethene	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
1,1-Dichloroethane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
1,2-Dichloroethene (trans)	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Chloroform	5.57E-11 J	5.57E-11 J	5.57E-11 J	5.57E-11 J	5.57E-11 J	5.57E-11 J	5.57E-11
1,2-Dichloroethane (EDC)	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
2-Butanone (MEK)	< 2.73E-09	< 2.80E-09	< 2.85E-09	< 2.84E-09	< 2.78E-09	< 2.72E-09	< 2.79E-09
1,1,1-Trichloroethane (TCA)	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Carbon Tetrachloride	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Vinyl acetate	< 5.46E-10	< 5.60E-10	< 5.70E-10	< 5.68E-10	< 5.55E-10	< 5.44E-10	< 5.57E-10
Bromodichloromethane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
1,2-Dichloropropane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
cis-1,3-Dichloropropene	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Trichloroethene (TCE)	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Dibromochloromethane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
1,1,2-Trichloroethane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Benzene	6.56E-11 JB	4.76E-11 JB	2.85E-11 JB	8.52E-11 JB	5.00E-11 JB	5.44E-11 JB	5.52E-11
trans-1,3-Dichloropropene	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Bromoform	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
4-Methyl-2-Pentanone (MIBK)	< 2.73E-09	< 2.80E-09	< 2.85E-09	< 2.84E-09	< 2.78E-09	< 2.72E-09	< 2.79E-09
2-Hexanone	< 2.73E-09	< 2.80E-09	< 2.85E-09	< 2.84E-09	< 2.78E-09	< 2.72E-09	< 2.79E-09
Tetrachloroethene (PCE)	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
1,1,2,2-Tetrachloroethane	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Toluene	2.73E-11 J	3.36E-11 J	1.43E-11 J	3.98E-11 J	1.94E-11 J	1.90E-11 J	2.56E-11
Chlorobenzene	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Ethylbenzene	< 1.37E-10	< 1.40E-10	< 1.43E-10	< 1.42E-10	< 1.39E-10	< 1.36E-10	< 1.39E-10
Styrene	< 1.37E-10	< 1.40E-10	< 1.43E-10	1.42E-11 J	< 1.39E-10	< 1.36E-10	≤ 1.18E-10
Xylenes (total)	1.64E-11 J	1.40E-11 J	< 1.43E-10	2.27E-11 J	< 1.39E-10	< 1.36E-10	≤ 7.84E-11
2-Chloroethyl vinyl ether	< 5.46E-10	< 5.60E-10	< 5.70E-10	< 5.68E-10	< 5.55E-10	< 5.44E-10	< 5.57E-10

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	2	2	2	2	2	2	2
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	
Test time	1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (ug/dscm):							
Chloromethane (Methyl Chloride)	1.14E+01	8.97E+01 E	3.47E+01	1.77E+01	1.60E+01	3.00E+01	3.33E+01
Bromomethane (Methyl Bromide)	2.98E+00	8.08E+00	4.25E+00	3.87E+00	3.25E+00	6.53E+00	4.82E+00
Vinyl Chloride	< 4.38E+00	< 4.49E+00	< 4.57E+00	< 4.55E+00	< 4.45E+00	< 4.35E+00	< 4.46E+00
Chloroethane (Ethyl Chloride)	< 4.38E+00	< 4.49E+00	< 4.57E+00	< 4.55E+00	< 4.45E+00	< 4.35E+00	< 4.46E+00
Methylene chloride	2.30E+00 JB	3.42E+00 JB	4.29E+00 JB	4.10E+00 JB	2.82E+00 JB	3.29E+00 JB	3.37E+00
Acetone	1.54E+02	4.18E+02	1.21E+02 J	1.63E+02 J	1.47E+02	1.53E+02	1.93E+02
Carbon Disulfide	3.50E-01 J	< 2.24E+00	< 2.28E+00	3.19E-01 J	4.00E-01 J	4.35E-01 J	≤ 1.01E+00
1,1-Dichloroethene	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
1,1-Dichloroethane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
1,2-Dichloroethene (trans)	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Chloroform	8.92E-01 J	8.92E-01 J	8.92E-01 J	8.92E-01 J	8.92E-01 J	8.92E-01 J	8.92E-01
1,2-Dichloroethane (EDC)	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
2-Butanone (MEK)	< 4.38E+01	< 4.49E+01	< 4.57E+01	< 4.55E+01	< 4.45E+01	< 4.35E+01	< 4.46E+01
1,1,1-Trichloroethane (TCA)	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Carbon Tetrachloride	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Vinyl acetate	< 8.75E+00	< 8.97E+00	< 9.13E+00	< 9.10E+00	< 8.90E+00	< 8.71E+00	< 8.93E+00
Bromodichloromethane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
1,2-Dichloropropane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
cis-1,3-Dichloropropene	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Trichloroethene (TCE)	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Dibromochloromethane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
1,1,2-Trichloroethane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Benzene	1.05E+00 JB	7.63E-01 JB	4.57E-01 JB	1.37E+00 JB	8.01E-01 JB	8.71E-01 JB	8.84E-01
trans-1,3-Dichloropropene	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Bromoform	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
4-Methyl-2-Pentanone (MIBK)	< 4.38E+01	< 4.49E+01	< 4.57E+01	< 4.55E+01	< 4.45E+01	< 4.35E+01	< 4.46E+01
2-Hexanone	< 4.38E+01	< 4.49E+01	< 4.57E+01	< 4.55E+01	< 4.45E+01	< 4.35E+01	< 4.46E+01
Tetrachloroethene (PCE)	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
1,1,2,2-Tetrachloroethane	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Toluene	4.38E-01 J	5.38E-01 J	2.28E-01 J	6.37E-01 J	3.11E-01 J	3.05E-01 J	4.10E-01
Chlorobenzene	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Ethylbenzene	< 2.19E+00	< 2.24E+00	< 2.28E+00	< 2.28E+00	< 2.22E+00	< 2.18E+00	< 2.23E+00
Styrene	< 2.19E+00	< 2.24E+00	< 2.28E+00	2.28E-01 J	< 2.22E+00	< 2.18E+00	≤ 1.89E+00
Xylenes (total)	2.63E-01 J	2.24E-01 J	< 2.28E+00	3.64E-01 J	< 2.22E+00	< 2.18E+00	≤ 1.26E+00
2-Chloroethyl vinyl ether	< 8.75E+00	< 8.97E+00	< 9.13E+00	< 9.10E+00	< 8.90E+00	< 8.71E+00	< 8.93E+00

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(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	2	2	2	2	2	2	2
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	
Test time	1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005	AVERAGE (2)
Test tube pair	1	2	3	4	5	6	
VOST EMISSIONS (ppm/v):							
Chloromethane (Methyl Chloride)	5.42E-03	4.28E-02 E	1.65E-02	8.46E-03	7.63E-03	1.43E-02	1.59E-02
Bromomethane (Methyl Bromide)	7.54E-04	2.05E-03	1.08E-03	9.80E-04	8.23E-04	1.66E-03	1.22E-03
Vinyl Chloride	< 1.68E-03	< 1.73E-03	< 1.76E-03	< 1.75E-03	< 1.71E-03	< 1.68E-03	< 1.72E-03
Chloroethane (Ethyl Chloride)	< 1.63E-03	< 1.67E-03	< 1.70E-03	< 1.70E-03	< 1.66E-03	< 1.62E-03	< 1.66E-03
Methylene chloride	6.52E-04 JB	9.69E-04 B	1.22E-03 JB	1.16E-03 JB	7.99E-04 JB	9.33E-04 JB	9.55E-04
Acetone	6.38E-02	1.73E-01	5.01E-02 J	6.75E-02 J	6.11E-02	6.35E-02	7.98E-02
Carbon Disulfide	1.11E-04 J	< 7.09E-04	< 7.22E-04	1.01E-04 J	1.27E-04 J	1.38E-04 J	≤ 3.18E-04
1,1-Dichloroethene	< 5.43E-04	< 5.57E-04	< 5.67E-04	< 5.65E-04	< 5.52E-04	< 5.40E-04	< 5.54E-04
1,1-Dichloroethane	< 5.32E-04	< 5.45E-04	< 5.55E-04	< 5.53E-04	< 5.41E-04	< 5.29E-04	< 5.43E-04
1,2-Dichloroethene (trans)	< 5.43E-04	< 5.57E-04	< 5.67E-04	< 5.65E-04	< 5.52E-04	< 5.40E-04	< 5.54E-04
Chloroform	1.80E-04 J	1.80E-04 B	1.80E-04 J	1.80E-04 J	1.80E-04 J	1.80E-04 J	1.80E-04
1,2-Dichloroethane (EDC)	< 5.32E-04	< 5.45E-04	< 5.55E-04	< 5.53E-04	< 5.41E-04	< 5.29E-04	< 5.43E-04
2-Butanone (MEK)	< 1.46E-02	< 1.50E-02	< 1.52E-02	< 1.52E-02	< 1.48E-02	< 1.45E-02	< 1.49E-02
1,1,1-Trichloroethane (TCA)	< 3.95E-04	< 4.05E-04	< 4.12E-04	< 4.10E-04	< 4.01E-04	< 3.93E-04	< 4.03E-04
Carbon Tetrachloride	< 3.42E-04	< 3.51E-04	< 3.57E-04	< 3.56E-04	< 3.48E-04	< 3.41E-04	< 3.49E-04
Vinyl acetate	< 2.45E-03	< 2.51E-03	< 2.55E-03	< 2.54E-03	< 2.49E-03	< 2.43E-03	< 2.50E-03
Bromodichloromethane	< 3.21E-04	< 3.29E-04	< 3.35E-04	< 3.34E-04	< 3.27E-04	< 3.20E-04	< 3.28E-04
1,2-Dichloropropane	< 4.66E-04	< 4.78E-04	< 4.86E-04	< 4.85E-04	< 4.74E-04	< 4.64E-04	< 4.75E-04
cis-1,3-Dichloropropene	< 4.74E-04	< 4.86E-04	< 4.95E-04	< 4.93E-04	< 4.82E-04	< 4.72E-04	< 4.84E-04
Trichloroethene (TCE)	< 4.01E-04	< 4.11E-04	< 4.18E-04	< 4.17E-04	< 4.07E-04	< 3.99E-04	< 4.09E-04
Dibromochloromethane	< 2.53E-04	< 2.59E-04	< 2.64E-04	< 2.63E-04	< 2.57E-04	< 2.51E-04	< 2.58E-04
1,1,2-Trichloroethane	< 3.95E-04	< 4.05E-04	< 4.12E-04	< 4.10E-04	< 4.01E-04	< 3.93E-04	< 4.03E-04
Benzene	3.23E-04 JB	2.35E-04 B	1.41E-04 JB	4.20E-04 JB	2.47E-04 JB	2.68E-04 JB	2.72E-04
trans-1,3-Dichloropropene	< 4.74E-04	< 4.86E-04	< 4.95E-04	< 4.93E-04	< 4.82E-04	< 4.72E-04	< 4.84E-04
Bromoform	< 2.08E-04	< 2.14E-04	< 2.17E-04	< 2.17E-04	< 2.12E-04	< 2.07E-04	< 2.12E-04
4-Methyl-2-Pentanone (MIBK)	< 1.05E-02	< 1.08E-02	< 1.10E-02	< 1.09E-02	< 1.07E-02	< 1.05E-02	< 1.07E-02
2-Hexanone	< 1.05E-02	< 1.08E-02	< 1.10E-02	< 1.09E-02	< 1.07E-02	< 1.05E-02	< 1.07E-02
Tetrachloroethene (PCE)	< 3.17E-04	< 3.26E-04	< 3.31E-04	< 3.30E-04	< 3.23E-04	< 3.16E-04	< 3.24E-04
1,1,2,2-Tetrachloroethane	< 3.14E-04	< 3.22E-04	< 3.27E-04	< 3.26E-04	< 3.19E-04	< 3.12E-04	< 3.20E-04
Toluene	1.14E-04 J	1.41E-04 B	5.96E-05 J	1.66E-04 J	8.13E-05 J	7.96E-05 J	1.07E-04
Chlorobenzene	< 4.68E-04	< 4.80E-04	< 4.88E-04	< 4.86E-04	< 4.75E-04	< 4.65E-04	< 4.77E-04
Ethylbenzene	< 4.96E-04	< 5.08E-04	< 5.17E-04	< 5.16E-04	< 5.04E-04	< 4.93E-04	< 5.06E-04
Styrene	< 5.05E-04	< 5.18E-04	< 5.27E-04	5.26E-05 J	< 5.14E-04	< 5.03E-04	≤ 4.37E-04
Xylenes (total)	5.95E-05 J	5.08E-05 B	< 5.17E-04	8.25E-05 J	< 5.04E-04	< 4.93E-04	≤ 2.85E-04
2-Chloroethyl vinyl ether	< 1.98E-03	< 2.03E-03	< 2.06E-03	< 2.06E-03	< 2.01E-03	< 1.97E-03	< 2.02E-03

B = Compound also detected in blank. Reported values are not blank corrected.
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E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	2	2	2	2	2	2	2
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	
Test time	1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (lb/hr):							
Chloromethane (Methyl Chloride)	4.16E-05	3.28E-04 E	1.27E-04	6.48E-05	5.85E-05	1.10E-04	1.22E-04
Bromomethane (Methyl Bromide)	1.09E-05	2.95E-05	1.55E-05	1.41E-05	1.19E-05	2.39E-05	1.76E-05
Vinyl Chloride	< 1.60E-05	< 1.64E-05	< 1.67E-05	< 1.66E-05	< 1.62E-05	< 1.59E-05	< 1.63E-05
Chloroethane (Ethyl Chloride)	< 1.60E-05	< 1.64E-05	< 1.67E-05	< 1.66E-05	< 1.62E-05	< 1.59E-05	< 1.63E-05
Methylene chloride	8.41E-06 JB	1.25E-05 JB	1.57E-05 JB	1.50E-05 JB	1.03E-05 JB	1.20E-05 JB	1.23E-05
Acetone	5.62E-04	1.53E-03	4.42E-04 J	5.95E-04 J	5.38E-04	5.60E-04	7.04E-04
Carbon Disulfide	1.28E-06 J	< 8.19E-06	< 8.34E-06	1.16E-06 J	1.46E-06 J	1.59E-06 J	≤ 3.67E-06
1,1-Dichloroethene	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
1,1-Dichloroethane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
1,2-Dichloroethene (trans)	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Chloroform	3.26E-06 J	3.26E-06 J	3.26E-06 J	3.26E-06 J	3.26E-06 J	3.26E-06 J	3.26E-06
1,2-Dichloroethane (EDC)	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
2-Butanone (MEK)	< 1.60E-04	< 1.64E-04	< 1.67E-04	< 1.66E-04	< 1.62E-04	< 1.59E-04	< 1.63E-04
1,1,1-Trichloroethane (TCA)	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Carbon Tetrachloride	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Vinyl acetate	< 3.20E-05	< 3.28E-05	< 3.34E-05	< 3.32E-05	< 3.25E-05	< 3.18E-05	< 3.26E-05
Bromodichloromethane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
1,2-Dichloropropane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
cis-1,3-Dichloropropene	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Trichloroethene (TCE)	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Dibromochloromethane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
1,1,2-Trichloroethane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Benzene	3.84E-06 JB	2.79E-06 JB	1.67E-06 JB	4.99E-06 JB	2.92E-06 JB	3.18E-06 JB	3.23E-06
trans-1,3-Dichloropropene	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Bromoform	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
4-Methyl-2-Pentanone (MIBK)	< 1.60E-04	< 1.64E-04	< 1.67E-04	< 1.66E-04	< 1.62E-04	< 1.59E-04	< 1.63E-04
2-Hexanone	< 1.60E-04	< 1.64E-04	< 1.67E-04	< 1.66E-04	< 1.62E-04	< 1.59E-04	< 1.63E-04
Tetrachloroethene (PCE)	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
1,1,2,2-Tetrachloroethane	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Toluene	1.60E-06 J	1.97E-06 J	8.34E-07 J	2.33E-06 J	1.14E-06 J	1.11E-06 J	1.50E-06
Chlorobenzene	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Ethylbenzene	< 7.99E-06	< 8.19E-06	< 8.34E-06	< 8.31E-06	< 8.12E-06	< 7.95E-06	< 8.15E-06
Styrene	< 7.99E-06	< 8.19E-06	< 8.34E-06	8.31E-07 J	< 8.12E-06	< 7.95E-06	≤ 6.91E-06
Xylenes (total)	9.59E-07 J	8.19E-07 J	< 8.34E-06	1.33E-06 J	< 8.12E-06	< 7.95E-06	≤ 4.59E-06
2-Chloroethyl vinyl ether	< 3.20E-05	< 3.28E-05	< 3.34E-05	< 3.32E-05	< 3.25E-05	< 3.18E-05	< 3.26E-05

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J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	2	2	2	2	2	2	2
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	02-02-96	
Test time	1419-1459	1542-1622	1628-1708	1730-1810	1825-1914	1925-2005	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (g/sec):							
Chloromethane (Methyl Chloride)	5.24E-06	4.13E-05 E	1.60E-05	8.17E-06	7.37E-06	1.38E-05	1.53E-05
Bromomethane (Methyl Bromide)	1.37E-06	3.72E-06	1.95E-06	1.78E-06	1.49E-06	3.01E-06	2.22E-06
Vinyl Chloride	< 2.01E-06	< 2.06E-06	< 2.10E-06	< 2.09E-06	< 2.05E-06	< 2.00E-06	< 2.05E-06
Chloroethane (Ethyl Chloride)	< 2.01E-06	< 2.06E-06	< 2.10E-06	< 2.09E-06	< 2.05E-06	< 2.00E-06	< 2.05E-06
Methylene chloride	1.06E-06 JB	1.57E-06 JB	1.98E-06 JB	1.89E-06 JB	1.30E-06 JB	1.52E-06 JB	1.55E-06
Acetone	7.08E-05	1.92E-04	5.57E-05 J	7.50E-05 J	6.78E-05	7.05E-05	8.87E-05
Carbon Disulfide	1.61E-07 J	< 1.03E-06	< 1.05E-06	1.47E-07 J	1.84E-07 J	2.00E-07 J	≤ 4.63E-07
1,1-Dichloroethene	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
1,1-Dichloroethane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
1,2-Dichloroethene (trans)	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Chloroform	4.11E-07 J	4.11E-07 J	4.11E-07 J	4.11E-07 J	4.11E-07 J	4.11E-07 J	4.11E-07
1,2-Dichloroethane (EDC)	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
2-Butanone (MEK)	< 2.01E-05	< 2.06E-05	< 2.10E-05	< 2.09E-05	< 2.05E-05	< 2.00E-05	< 2.05E-05
1,1,1-Trichloroethane (TCA)	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Carbon Tetrachloride	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Vinyl acetate	< 4.03E-06	< 4.13E-06	< 4.20E-06	< 4.19E-06	< 4.09E-06	< 4.01E-06	< 4.11E-06
Bromodichloromethane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
1,2-Dichloropropane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
cis-1,3-Dichloropropene	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Trichloroethene (TCE)	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Dibromochloromethane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
1,1,2-Trichloroethane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Benzene	4.83E-07 JB	3.51E-07 JB	2.10E-07 JB	6.28E-07 JB	3.68E-07 JB	4.01E-07 JB	4.07E-07
trans-1,3-Dichloropropene	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Bromoform	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
4-Methyl-2-Pentanone (MIBK)	< 2.01E-05	< 2.06E-05	< 2.10E-05	< 2.09E-05	< 2.05E-05	< 2.00E-05	< 2.05E-05
2-Hexanone	< 2.01E-05	< 2.06E-05	< 2.10E-05	< 2.09E-05	< 2.05E-05	< 2.00E-05	< 2.05E-05
Tetrachloroethene (PCE)	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
1,1,2,2-Tetrachloroethane	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Toluene	2.01E-07 J	2.48E-07 J	1.05E-07 J	2.93E-07 J	1.43E-07 J	1.40E-07 J	1.89E-07
Chlorobenzene	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Ethylbenzene	< 1.01E-06	< 1.03E-06	< 1.05E-06	< 1.05E-06	< 1.02E-06	< 1.00E-06	< 1.03E-06
Styrene	< 1.01E-06	< 1.03E-06	< 1.05E-06	1.05E-07 J	< 1.02E-06	< 1.00E-06	≤ 8.70E-07
Xylenes (total)	1.21E-07 J	1.03E-07 J	< 1.05E-06	1.68E-07 J	< 1.02E-06	< 1.00E-06	≤ 5.78E-07
2-Chloroethyl vinyl ether	< 4.03E-06	< 4.13E-06	< 4.20E-06	< 4.19E-06	< 4.09E-06	< 4.01E-06	< 4.11E-06

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

	M.W.						
TEST DATA:							
Test run number		3	3	3	3	3	3
Test location		OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date		02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96
Test time		1418-1458	1503-1543	1600-1640	1652-1750	1802-1842	1910-1950
Test tube pair		1	2	3	4	5	6
SAMPLING DATA:							
Duration, minutes		40.00	40.00	40.00	40.00	40.00	40.00
Average dry gas meter press. in. H_2O		1.50	1.50	1.48	1.49	1.50	1.50
Average dry gas meter temp. deg. C		5.94	5.88	5.94	6.38	7.44	6.81
Average dry gas meter temp. deg. F		42.69	42.58	42.69	43.48	45.39	44.26
Average absolute meter temp. deg. R		502.69	502.58	502.69	503.48	505.39	504.26
Actual sample volume, liters		21.420	22.233	20.770	22.441	22.218	23.278
Meter box calibration, Y		1.0060	1.0060	1.0060	1.0060	1.0060	1.0060
Barometric pressure, in. Hg		30.28	30.28	30.28	30.28	30.28	30.28
Sample volume, dscf		0.8116	0.8425	0.7869	0.8489	0.8373	0.8792
Volumetric flow rate, dscf/min (1)		950	950	950	950	950	950
LABORATORY DATA, ng:	**M.W.**						
Chloromethane (Methyl Chloride)	50.49	520.000 J	431.000	730.000	330.000	4600.000 E	2500.000 E
Bromomethane (Methyl Bromide)	94.95	136.000 JB	237.000 B	78.000	87.000	260.000	360.000
Vinyl Chloride	62.50	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U
Chloroethane (Ethyl Chloride)	64.52	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U	100.000 U
Methylene chloride	84.93	138.905 B	90.390 B	75.723 JB	78.694 JB	114.139 JB	95.148 B
Acetone	58.09	2710.608	2512.393	1553.266 J	3146.852 J	2188.704	1548.178
Carbon Disulfide	76.13	11.000 J	13.000 J	7.000 J	7.000 J	50.000 U	6.000 J
1,1-Dichloroethene	96.94	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1-Dichloroethane	98.96	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,2-Dichloroethene (trans)	96.94	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Chloroform	119.37	12.968 J	13.463 J	12.574 J	13.565 J	13.380 J	14.049 J
1,2-Dichloroethane (EDC)	98.96	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
2-Butanone (MEK)	72.12	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
1,1,1-Trichloroethane (TCA)	133.40	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Carbon Tetrachloride	153.81	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Vinyl acetate	86.09	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U
Bromodichloromethane	163.83	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,2-Dichloropropane	112.99	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
cis-1,3-Dichloropropene	110.98	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Trichloroethene (TCE)	131.38	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Dibromochloromethane	208.29	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1,2-Trichloroethane	133.40	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Benzene	78.12	28.000 JB	61.000 JB	23.000 JB	25.000 JB	19.000 JB	18.000 JB
trans-1,3-Dichloropropene	110.98	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Bromoform	252.75	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
4-Methyl-2-Pentanone (MIBK)	100.18	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
2-Hexanone	100.18	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U	1000.000 U
Tetrachloroethene (PCE)	165.82	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
1,1,2,2-Tetrachloroethane	167.84	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Toluene	92.15	11.000 J	25.000	10.000 J	8.000 J	7.000 J	5.000 J
Chlorobenzene	112.56	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Ethylbenzene	106.18	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U	50.000 U
Styrene	104.16	50.000 U	12.000 J	50.000 U	50.000 U	50.000 U	50.000 U
Xylenes (total)	106.18	10.000 J	9.000 J	50.000 U	3.000 J	3.000 J	50.000 U
2-Chloroethyl vinyl ether	106.55	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U	200.000 U

U = detection limit value.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
B = Compound also detected in blank. Reported values are not blank corrected.
(1) Volumetric flow rate based on average of Particulate/HCl and MMTL tests flow measurements.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:														
Test run number		3		3		3		3		3		3		3
Test location		OUTLET		OUTLET		OUTLET		OUTLET		OUTLET		OUTLET		OUTLET
Test date		02-04-96		02-04-96		02-04-96		02-04-96		02-04-96		02-04-96		
Test time		1418-1458		1503-1543		1600-1640		1652-1750		1802-1842		1910-1950		
Test tube pair		1		2		3		4		5		6		AVERAGE (2)
VOST EMISSIONS (lbs/dscf):														
Chloromethane (Methyl Chloride)		1.41E-09 J		1.13E-09		2.05E-09		8.57E-10		1.21E-08 E		6.27E-09 E		3.97E-09
Bromomethane (Methyl Bromide)		3.69E-10 JB		6.20E-10 B		2.19E-10		2.26E-10		6.85E-10		9.03E-10		5.04E-10
Vinyl Chloride	<	2.72E-10	<	2.62E-10	<	2.80E-10	<	2.60E-10	<	2.63E-10	<	2.51E-10	<	2.65E-10
Chloroethane (Ethyl Chloride)	<	2.72E-10	<	2.62E-10	<	2.80E-10	<	2.60E-10	<	2.63E-10	<	2.51E-10	<	2.65E-10
Methylene chloride		3.77E-10 B		2.37E-10 B		2.12E-10 JB		2.04E-10 JB		3.01E-10 JB		2.39E-10 B		2.62E-10
Acetone		7.36E-09		6.57E-09		4.35E-09 J		8.17E-09 J		5.76E-09		3.88E-09		6.02E-09
Carbon Disulfide		2.99E-11 J		3.40E-11 J		1.96E-11 J		1.82E-11 J	<	1.32E-10		1.50E-11 J	≤	4.14E-11
1,1-Dichloroethene	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
1,1-Dichloroethane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
1,2-Dichloroethene (trans)	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Chloroform		3.52E-11 J		3.52E-11 J		3.52E-11 J		3.52E-11 J		3.52E-11 J		3.52E-11 J		3.52E-11
1,2-Dichloroethane (EDC)	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
2-Butanone (MEK)	<	2.72E-09	<	2.62E-09	<	2.80E-09	<	2.60E-09	<	2.63E-09	<	2.51E-09	<	2.65E-09
1,1,1-Trichloroethane (TCA)	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Carbon Tetrachloride	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Vinyl acetate	<	5.43E-10	<	5.23E-10	<	5.60E-10	<	5.19E-10	<	5.27E-10	<	5.01E-10	<	5.29E-10
Bromodichloromethane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
1,2-Dichloropropane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
cis-1,3-Dichloropropene	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Trichloroethene (TCE)	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Dibromochloromethane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
1,1,2-Trichloroethane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Benzene		7.61E-11 JB		1.60E-10 JB		6.44E-11 JB		6.49E-11 JB		5.00E-11 JB		4.51E-11 JB		7.67E-11
trans-1,3-Dichloropropene	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Bromoform	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
4-Methyl-2-Pentanone (MIBK)	<	2.72E-09	<	2.62E-09	<	2.80E-09	<	2.60E-09	<	2.63E-09	<	2.51E-09	<	2.65E-09
2-Hexanone	<	2.72E-09	<	2.62E-09	<	2.80E-09	<	2.60E-09	<	2.63E-09	<	2.51E-09	<	2.65E-09
Tetrachloroethene (PCE)	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
1,1,2,2-Tetrachloroethane	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Toluene		2.99E-11 J		6.54E-11		2.80E-11 J		2.08E-11 J		1.84E-11 J		1.25E-11 J		2.92E-11
Chlorobenzene	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Ethylbenzene	<	1.36E-10	<	1.31E-10	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	<	1.32E-10
Styrene	<	1.36E-10		3.14E-11 J	<	1.40E-10	<	1.30E-10	<	1.32E-10	<	1.25E-10	≤	1.16E-10
Xylenes (total)		2.72E-11 J		2.35E-11 J	<	1.40E-10		7.79E-12 J		7.90E-12 J	<	1.25E-10	≤	5.53E-11
2-Chloroethyl vinyl ether	<	5.43E-10	<	5.23E-10	<	5.60E-10	<	5.19E-10	<	5.27E-10	<	5.01E-10	<	5.29E-10

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	3	3	3	3	3	3	3
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	
Test time	1418-1458	1503-1543	1600-1640	1652-1750	1802-1842	1910-1950	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (ug/dscm):							
Chloromethane (Methyl Chloride)	2.26E+01 J	1.81E+01	3.28E+01	1.37E+01	1.94E+02 E	1.00E+02 E	6.36E+01
Bromomethane (Methyl Bromide)	5.92E+00 JB	9.93E+00 B	3.50E+00	3.62E+00	1.10E+01	1.45E+01	8.07E+00
Vinyl Chloride	< 4.35E+00	< 4.19E+00	< 4.49E+00	< 4.16E+00	< 4.22E+00	< 4.02E+00	< 4.24E+00
Chloroethane (Ethyl Chloride)	< 4.35E+00	< 4.19E+00	< 4.49E+00	< 4.16E+00	< 4.22E+00	< 4.02E+00	< 4.24E+00
Methylene chloride	6.04E+00 B	3.79E+00 B	3.40E+00 JB	3.27E+00 JB	4.81E+00 JB	3.82E+00 B	4.19E+00
Acetone	1.18E+02	1.05E+02	6.97E+01 J	1.31E+02 J	9.23E+01	6.22E+01	9.64E+01
Carbon Disulfide	4.79E-01 J	5.45E-01 J	3.14E-01 J	2.91E-01 J	< 2.11E+00	2.41E-01 J	≤ 6.63E-01
1,1-Dichloroethene	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
1,1-Dichloroethane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
1,2-Dichloroethene (trans)	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Chloroform	5.64E-01 J	5.64E-01 J	5.64E-01 J	5.64E-01 J	5.64E-01 J	5.64E-01 J	5.64E-01
1,2-Dichloroethane (EDC)	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
2-Butanone (MEK)	< 4.35E+01	< 4.19E+01	< 4.49E+01	< 4.16E+01	< 4.22E+01	< 4.02E+01	< 4.24E+01
1,1,1-Trichloroethane (TCA)	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Carbon Tetrachloride	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Vinyl acetate	< 8.70E+00	< 8.38E+00	< 8.97E+00	< 8.32E+00	< 8.43E+00	< 8.03E+00	< 8.47E+00
Bromodichloromethane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
1,2-Dichloropropane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
cis-1,3-Dichloropropene	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Trichloroethene (TCE)	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Dibromochloromethane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
1,1,2-Trichloroethane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Benzene	1.22E+00 JB	2.56E+00 JB	1.03E+00 JB	1.04E+00 JB	8.01E-01 JB	7.23E-01 JB	1.23E+00
trans-1,3-Dichloropropene	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Bromoform	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
4-Methyl-2-Pentanone (MIBK)	< 4.35E+01	< 4.19E+01	< 4.49E+01	< 4.16E+01	< 4.22E+01	< 4.02E+01	< 4.24E+01
2-Hexanone	< 4.35E+01	< 4.19E+01	< 4.49E+01	< 4.16E+01	< 4.22E+01	< 4.02E+01	< 4.24E+01
Tetrachloroethene (PCE)	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
1,1,2,2-Tetrachloroethane	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Toluene	4.79E-01 J	1.05E+00	4.49E-01 J	3.33E-01 J	2.95E-01 J	2.01E-01 J	4.67E-01
Chlorobenzene	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Ethylbenzene	< 2.18E+00	< 2.10E+00	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	< 2.12E+00
Styrene	< 2.18E+00	5.03E-01 J	< 2.24E+00	< 2.08E+00	< 2.11E+00	< 2.01E+00	≤ 1.85E+00
Xylenes (total)	4.35E-01 J	3.77E-01 J	< 2.24E+00	1.25E-01 J	1.27E-01 J	< 2.01E+00	≤ 8.86E-01
2-Chloroethyl vinyl ether	< 8.70E+00	< 8.38E+00	< 8.97E+00	< 8.32E+00	< 8.43E+00	< 8.03E+00	< 8.47E+00

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	3	3	3	3	3	3	3
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	
Test time	1418-1458	1503-1543	1600-1640	1652-1750	1802-1842	1910-1950	
Test tube pair	1	2	3	4	5	6	AVERAGE(2)
VOST EMISSIONS (ppm/v):							
Chloromethane (Methyl Chloride)	1.08E-02 J	8.61E-03	1.56E-02	6.54E-03	9.24E-02 E	4.78E-02 E	3.03E-02
Bromomethane (Methyl Bromide)	1.50E-03 JB	2.52E-03 B	8.87E-04	9.17E-04	2.78E-03	3.66E-03	2.04E-03
Vinyl Chloride	< 1.67E-03	< 1.61E-03	< 1.73E-03	< 1.60E-03	< 1.62E-03	< 1.55E-03	< 1.63E-03
Chloroethane (Ethyl Chloride)	< 1.62E-03	< 1.56E-03	< 1.67E-03	< 1.55E-03	< 1.57E-03	< 1.50E-03	< 1.58E-03
Methylene chloride	1.71E-03 B	1.07E-03 B	9.63E-04 JB	9.27E-04 JB	1.36E-03 JB	1.08E-03 B	1.19E-03
Acetone	4.88E-02	4.36E-02	2.89E-02 J	5.42E-02 J	3.82E-02	2.58E-02	3.99E-02
Carbon Disulfide	1.51E-04 J	1.72E-04 B	9.93E-05 J	9.20E-05 J	< 6.66E-04	7.62E-05 J	≤ 2.10E-04
1,1-Dichloroethene	< 5.40E-04	< 5.20E-04	< 5.57E-04	< 5.16E-04	< 5.23E-04	< 4.98E-04	< 5.26E-04
1,1-Dichloroethane	< 5.29E-04	< 5.09E-04	< 5.45E-04	< 5.06E-04	< 5.13E-04	< 4.88E-04	< 5.15E-04
1,2-Dichloroethene (trans)	< 5.40E-04	< 5.20E-04	< 5.57E-04	< 5.16E-04	< 5.23E-04	< 4.98E-04	< 5.26E-04
Chloroform	1.14E-04 J	1.14E-04 B	1.14E-04 J	1.14E-04 J	1.14E-04 J	1.14E-04 J	1.14E-04
1,2-Dichloroethane (EDC)	< 5.29E-04	< 5.09E-04	< 5.45E-04	< 5.06E-04	< 5.13E-04	< 4.88E-04	< 5.15E-04
2-Butanone (MEK)	< 1.45E-02	< 1.40E-02	< 1.50E-02	< 1.39E-02	< 1.41E-02	< 1.34E-02	< 1.41E-02
1,1,1-Trichloroethane (TCA)	< 3.92E-04	< 3.78E-04	< 4.05E-04	< 3.75E-04	< 3.80E-04	< 3.62E-04	< 3.82E-04
Carbon Tetrachloride	< 3.40E-04	< 3.28E-04	< 3.51E-04	< 3.25E-04	< 3.30E-04	< 3.14E-04	< 3.31E-04
Vinyl acetate	< 2.43E-03	< 2.34E-03	< 2.51E-03	< 2.32E-03	< 2.36E-03	< 2.24E-03	< 2.37E-03
Bromodichloromethane	< 3.19E-04	< 3.08E-04	< 3.29E-04	< 3.05E-04	< 3.10E-04	< 2.95E-04	< 3.11E-04
1,2-Dichloropropane	< 4.63E-04	< 4.46E-04	< 4.78E-04	< 4.43E-04	< 4.49E-04	< 4.28E-04	< 4.51E-04
cis-1,3-Dichloropropene	< 4.72E-04	< 4.54E-04	< 4.86E-04	< 4.51E-04	< 4.57E-04	< 4.35E-04	< 4.59E-04
Trichloroethene (TCE)	< 3.98E-04	< 3.84E-04	< 4.11E-04	< 3.81E-04	< 3.86E-04	< 3.68E-04	< 3.88E-04
Dibromochloromethane	< 2.51E-04	< 2.42E-04	< 2.59E-04	< 2.40E-04	< 2.44E-04	< 2.32E-04	< 2.45E-04
1,1,2-Trichloroethane	< 3.92E-04	< 3.78E-04	< 4.05E-04	< 3.75E-04	< 3.80E-04	< 3.62E-04	< 3.82E-04
Benzene	3.75E-04 JB	7.87E-04 B	3.18E-04 JB	3.20E-04 JB	2.47E-04 JB	2.23E-04 JB	3.78E-04
trans-1,3-Dichloropropene	< 4.72E-04	< 4.54E-04	< 4.86E-04	< 4.51E-04	< 4.57E-04	< 4.35E-04	< 4.59E-04
Bromoform	< 2.07E-04	< 1.99E-04	< 2.14E-04	< 1.98E-04	< 2.01E-04	< 1.91E-04	< 2.02E-04
4-Methyl-2-Pentanone (MIBK)	< 1.04E-02	< 1.01E-02	< 1.08E-02	< 9.99E-03	< 1.01E-02	< 9.65E-03	< 1.02E-02
2-Hexanone	< 1.04E-02	< 1.01E-02	< 1.08E-02	< 9.99E-03	< 1.01E-02	< 9.65E-03	< 1.02E-02
Tetrachloroethene (PCE)	< 3.16E-04	< 3.04E-04	< 3.26E-04	< 3.02E-04	< 3.06E-04	< 2.91E-04	< 3.07E-04
1,1,2,2-Tetrachloroethane	< 3.12E-04	< 3.00E-04	< 3.22E-04	< 2.98E-04	< 3.02E-04	< 2.88E-04	< 3.04E-04
Toluene	1.25E-04 J	2.74E-04	1.17E-04 J	8.69E-05 J	7.71E-05 J	5.24E-05 J	1.22E-04
Chlorobenzene	< 4.65E-04	< 4.48E-04	< 4.80E-04	< 4.45E-04	< 4.51E-04	< 4.29E-04	< 4.53E-04
Ethylbenzene	< 4.93E-04	< 4.75E-04	< 5.08E-04	< 4.71E-04	< 4.78E-04	< 4.55E-04	< 4.80E-04
Styrene	< 5.02E-04	1.16E-04 B	< 5.18E-04	< 4.80E-04	< 4.87E-04	< 4.64E-04	≤ 4.28E-04
Xylenes (total)	9.86E-05 J	8.55E-05 B	< 5.08E-04	2.83E-05 J	2.87E-05 J	< 4.55E-04	≤ 2.01E-04
2-Chloroethyl vinyl ether	< 1.96E-03	< 1.89E-03	< 2.03E-03	< 1.88E-03	< 1.90E-03	< 1.81E-03	< 1.91E-03

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J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	3	3	3	3	3	3	3
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	
Test time	1418-1458	1503-1543	1600-1640	1652-1750	1802-1842	1910-1950	AVERAGE (2)
Test tube pair	1	2	3	4	5	6	
VOST EMISSIONS (lb/hr):							
Chloromethane (Methyl Chloride)	8.05E-05 J	6.43E-05	1.17E-04	4.89E-05	6.90E-04 E	3.57E-04 E	2.26E-04
Bromomethane (Methyl Bromide)	2.11E-05 JB	3.53E-05 B	1.25E-05	1.29E-05	3.90E-05	5.15E-05	2.87E-05
Vinyl Chloride	< 1.55E-05	< 1.49E-05	< 1.60E-05	< 1.48E-05	< 1.50E-05	< 1.43E-05	< 1.51E-05
Chloroethane (Ethyl Chloride)	< 1.55E-05	< 1.49E-05	< 1.60E-05	< 1.48E-05	< 1.50E-05	< 1.43E-05	< 1.51E-05
Methylene chloride	2.15E-05 B	1.35E-05 B	1.21E-05 JB	1.16E-05 JB	1.71E-05 JB	1.36E-05 B	1.49E-05
Acetone	4.20E-04	3.75E-04	2.48E-04 J	4.66E-04 J	3.28E-04	2.21E-04	3.43E-04
Carbon Disulfide	1.70E-06 J	1.94E-06 J	1.12E-06 J	1.04E-06 J	< 7.50E-06	8.58E-07 J	≤ 2.36E-06
1,1-Dichloroethene	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
1,1-Dichloroethane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
1,2-Dichloroethene (trans)	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Chloroform	2.01E-06 J	2.01E-06 J	2.01E-06 J	2.01E-06 J	2.01E-06 J	2.01E-06 J	2.01E-06
1,2-Dichloroethane (EDC)	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
2-Butanone (MEK)	< 1.55E-04	< 1.49E-04	< 1.60E-04	< 1.48E-04	< 1.50E-04	< 1.43E-04	< 1.51E-04
1,1,1-Trichloroethane (TCA)	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Carbon Tetrachloride	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Vinyl acetate	< 3.10E-05	< 2.98E-05	< 3.19E-05	< 2.96E-05	< 3.00E-05	< 2.86E-05	< 3.02E-05
Bromodichloromethane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
1,2-Dichloropropane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
cis-1,3-Dichloropropene	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Trichloroethene (TCE)	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Dibromochloromethane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
1,1,2-Trichloroethane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Benzene	4.34E-06 JB	9.10E-06 JB	3.67E-06 JB	3.70E-06 JB	2.85E-06 JB	2.57E-06 JB	4.37E-06
trans-1,3-Dichloropropene	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Bromoform	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
4-Methyl-2-Pentanone (MIBK)	< 1.55E-04	< 1.49E-04	< 1.60E-04	< 1.48E-04	< 1.50E-04	< 1.43E-04	< 1.51E-04
2-Hexanone	< 1.55E-04	< 1.49E-04	< 1.60E-04	< 1.48E-04	< 1.50E-04	< 1.43E-04	< 1.51E-04
Tetrachloroethene (PCE)	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
1,1,2,2-Tetrachloroethane	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Toluene	1.70E-06 J	3.73E-06	1.60E-06 J	1.18E-06 J	1.05E-06 J	7.15E-07 J	1.66E-06
Chlorobenzene	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Ethylbenzene	< 7.74E-06	< 7.46E-06	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	< 7.54E-06
Styrene	< 7.74E-06	1.79E-06 J	< 7.98E-06	< 7.40E-06	< 7.50E-06	< 7.15E-06	≤ 6.59E-06
Xylenes (total)	1.55E-06 J	1.34E-06 J	< 7.98E-06	4.44E-07 J	4.50E-07 J	< 7.15E-06	≤ 3.15E-06
2-Chloroethyl vinyl ether	< 3.10E-05	< 2.98E-05	< 3.19E-05	< 2.96E-05	< 3.00E-05	< 2.86E-05	< 3.02E-05

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, AL
SUMMARY OF VOLATILE ORGANICS TEST DATA AND TEST RESULTS
AFTERBURNER DISCHARGE STACK

TEST DATA:							
Test run number	3	3	3	3	3	3	3
Test location	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET	OUTLET
Test date	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	02-04-96	
Test time	1418-1458	1503-1543	1600-1640	1652-1750	1802-1842	1910-1950	
Test tube pair	1	2	3	4	5	6	AVERAGE (2)
VOST EMISSIONS (g/sec):							
Chloromethane (Methyl Chloride)	1.01E-05 J	8.10E-06	1.47E-05	6.16E-06	8.70E-05 E	4.50E-05 E	2.85E-05
Bromomethane (Methyl Bromide)	2.65E-06 JB	4.45E-06 B	1.57E-06	1.62E-06	4.92E-06	6.48E-06	3.62E-06
Vinyl Chloride	< 1.95E-06	< 1.88E-06	< 2.01E-06	< 1.87E-06	< 1.89E-06	< 1.80E-06	< 1.90E-06
Chloroethane (Ethyl Chloride)	< 1.95E-06	< 1.88E-06	< 2.01E-06	< 1.87E-06	< 1.89E-06	< 1.80E-06	< 1.90E-06
Methylene chloride	2.71E-06 B	1.70E-06 B	1.52E-06 JB	1.47E-06 JB	2.16E-06 JB	1.71E-06 B	1.88E-06
Acetone	5.29E-05	4.72E-05	3.13E-05 J	5.87E-05 J	4.14E-05	2.79E-05	4.32E-05
Carbon Disulfide	2.15E-07 J	2.44E-07 J	1.41E-07 J	1.31E-07 J	< 9.45E-07	1.08E-07 J	≤ 2.97E-07
1,1-Dichloroethene	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
1,1-Dichloroethane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
1,2-Dichloroethene (trans)	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Chloroform	2.53E-07 J	2.53E-07 J	2.53E-07 J	2.53E-07 J	2.53E-07 J	2.53E-07 J	2.53E-07
1,2-Dichloroethane (EDC)	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
2-Butanone (MEK)	< 1.95E-05	< 1.88E-05	< 2.01E-05	< 1.87E-05	< 1.89E-05	< 1.80E-05	< 1.90E-05
1,1,1-Trichloroethane (TCA)	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Carbon Tetrachloride	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Vinyl acetate	< 3.90E-06	< 3.76E-06	< 4.02E-06	< 3.73E-06	< 3.78E-06	< 3.60E-06	< 3.80E-06
Bromodichloromethane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
1,2-Dichloropropane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
cis-1,3-Dichloropropene	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Trichloroethene (TCE)	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Dibromochloromethane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
1,1,2-Trichloroethane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Benzene	5.46E-07 JB	1.15E-06 JB	4.63E-07 JB	4.66E-07 JB	3.59E-07 JB	3.24E-07 JB	5.51E-07
trans-1,3-Dichloropropene	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Bromoform	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
4-Methyl-2-Pentanone (MIBK)	< 1.95E-05	< 1.88E-05	< 2.01E-05	< 1.87E-05	< 1.89E-05	< 1.80E-05	< 1.90E-05
2-Hexanone	< 1.95E-05	< 1.88E-05	< 2.01E-05	< 1.87E-05	< 1.89E-05	< 1.80E-05	< 1.90E-05
Tetrachloroethene (PCE)	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
1,1,2,2-Tetrachloroethane	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Toluene	2.15E-07 J	4.70E-07	2.01E-07 J	1.49E-07 J	1.32E-07 J	9.00E-08 J	2.10E-07
Chlorobenzene	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Ethylbenzene	< 9.75E-07	< 9.40E-07	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	< 9.50E-07
Styrene	< 9.75E-07	2.26E-07 J	< 1.01E-06	< 9.33E-07	< 9.45E-07	< 9.00E-07	≤ 8.31E-07
Xylenes (total)	1.95E-07 J	1.69E-07 J	< 1.01E-06	5.60E-08 J	5.67E-08 J	< 9.00E-07	≤ 3.97E-07
2-Chloroethyl vinyl ether	< 3.90E-06	< 3.76E-06	< 4.02E-06	< 3.73E-06	< 3.78E-06	< 3.60E-06	< 3.80E-06

B = Compound also detected in blank. Reported values are not blank corrected.
J = Estimated value below the detection limit.
E= Estimated value above the detection limit.
(2) Detection limit values included in overall average.

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF METALS TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0103	1406-2011	1415-2026
SAMPLING DATA			
Sampling duration, min.	320.0	320.0	320.0
Nozzle diameter, in.	0.586	0.586	0.586
Cross sectional nozzle area, sq.ft.	0.001873	0.001873	0.001873
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.60	0.57	0.46
Avg. dry gas meter temp., deg F	53	43	44
Avg. abs. dry gas meter temp., deg. R	513	503	504
Total liquid collected by train, ml	262.6	255.9	196.1
Std. vol. of H_2O vapor coll., cu.ft.	12.4	12.0	9.2
Dry gas meter calibration factor	0.9958	0.9958	0.9939
Sample vol. at meter cond., dcf	133.154	130.320	118.896
Sample vol. at std. cond., dscf (1)	135.801	134.777	125.265
Percent of isokinetic sampling	103.3	105.6	103.1
GAS STREAM COMPOSITION DATA			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.4	29.4	29.5
H_2O vapor in gas stream, prop. by vol.	0.083	0.082	0.069
Mole fraction of dry gas	0.917	0.918	0.931
Molecular wt. of wet gas, lb/lb mole	28.4	28.5	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA			
Static pressure, in. Hg	-0.10	-0.10	-0.10
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1681	1646	1638
Avg. absolute temperature, deg.R	2141	2106	2098
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	16	16	16
Avg. gas stream velocity, ft./sec.	16.3	15.6	14.3
Stack/duct cross sectional area, sq.ft.	4.59	4.59	4.59
Avg. gas stream volumetric flow, wacf/min.	4480	4290	3920
Avg. gas stream volumetric flow, dscf/min (1)	1010	980	930

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF METALS TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0103	1406-2011	1415-2026

METALS LABORATORY REPORT DATA, ug	T1	T2	T3
Antimony (Sb)	4.20	1.00	< 11.30
Arsenic (As)	< 7.65	< 7.70	< 7.60
Barium (Ba)	22.04	0.29	0.22
Beryllium (Be)	0.02	< 0.03	< 0.03
Cadmium (Cd)	1.60	0.79	< 0.70
Chromium (Cr)	43.70	44.52	31.89
Lead (Pb)	17.30	3.70	2.50
Mercury (Hg)	0.14	0.25	0.03
Nickel (Ni)	10.53	12.70	2.60
Selenium (Se)	< 8.85	< 8.90	< 8.80
Silver (Ag)	< 2.25	< 2.25	< 2.24
Thallium (Tl)	< 7.80	< 7.80	< 7.80

METALS CONCENTRATIONS, ug/dscm [(1)]	T1	T2	T3
Antimony (Sb)	1.09E+00	2.61E-01	<3.19E+00
Arsenic (As)	<1.99E+00	<2.02E+00	<2.14E+00
Barium (Ba)	5.73E+00	7.60E-02	6.20E-02
Beryllium (Be)	5.20E-03	< 6.55E-03	< 7.05E-03
Cadmium (Cd)	4.16E-01	2.07E-01	< 1.97E-01
Chromium (Cr)	1.14E+01	1.17E+01	8.99E+00
Lead (Pb)	4.50E+00	9.70E-01	7.05E-01
Mercury (Hg)	3.64E-02	6.42E-02	8.46E-03
Nickel (Ni)	2.74E+00	3.33E+00	7.33E-01
Selenium (Se)	<2.30E+00	<2.33E+00	<2.48E+00
Silver (Ag)	< 5.84E-01	< 5.90E-01	< 6.32E-01
Thallium (Tl)	<2.03E+00	<2.04E+00	<2.20E+00

METALS CONCENTRATIONS, lb/dscf [(1)]	T1	T2	T3
Antimony (Sb)	6.81E-11	1.63E-11	< 1.99E-10
Arsenic (As)	< 1.24E-10	< 1.26E-10	< 1.34E-10
Barium (Ba)	3.58E-10	4.74E-12	3.87E-12
Beryllium (Be)	3.25E-13	< 4.09E-13	< 4.40E-13
Cadmium (Cd)	2.60E-11	1.29E-11	< 1.23E-11
Chromium (Cr)	7.09E-10	7.28E-10	5.61E-10
Lead (Pb)	2.81E-10	6.05E-11	4.40E-11
Mercury (Hg)	2.27E-12	4.01E-12	5.28E-13
Nickel (Ni)	1.71E-10	2.08E-10	4.58E-11
Selenium (Se)	< 1.44E-10	< 1.46E-10	< 1.55E-10
Silver (Ag)	< 3.64E-11	< 3.68E-11	< 3.94E-11
Thallium (Tl)	< 1.27E-10	< 1.28E-10	< 1.37E-10

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF METALS TEST DATA AND TEST RESULTS

TEST DATA			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1834-0103	1406-2011	1415-2026

METALS MASS EMISSION RATES, lb/hr			
Antimony (Sb)	4.11E-06	9.54E-07	< 1.11E-05
Arsenic (As)	< 7.50E-06	< 7.38E-06	< 7.46E-06
Barium (Ba)	2.16E-05	2.78E-07	2.16E-07
Beryllium (Be)	1.96E-08	< 2.40E-08	< 2.45E-08
Cadmium (Cd)	1.57E-06	7.57E-07	< 6.87E-07
Chromium (Cr)	4.28E-05	4.27E-05	3.13E-05
Lead (Pb)	1.70E-05	3.55E-06	2.45E-06
Mercury (Hg)	1.37E-07	2.35E-07	2.95E-08
Nickel (Ni)	1.03E-05	1.22E-05	2.55E-06
Selenium (Se)	< 8.68E-06	< 8.53E-06	< 8.64E-06
Silver (Ag)	< 2.20E-06	< 2.16E-06	< 2.20E-06
Thallium (Tl)	< 7.65E-06	< 7.48E-06	< 7.66E-06

ALABAMA ARMY AMMUNITION PLANT
CHILDERSBURG, ALABAMA
HOT GAS TEST PROGRAM
SUMMARY OF HEXAVALENT CHROMIUM TEST DATA AND TEST RESULTS

TEST DATA:			
Test run number	T1	T2	T3
Test location	AFTERBURNER DISCHARGE		
Test date	01-31-96	02-02-96	02-04-96
Test time period	1837-0127	1404-2043	1416-2050
SAMPLING DATA:			
Sampling duration, min.	360.0	360.0	360.0
Nozzle diameter, in.	0.586	0.586	0.586
Barometric pressure, in. Hg	29.73	29.59	30.28
Avg. orifice press. diff., in H_2O	0.53	0.52	0.45
Avg. dry gas meter temp., deg F	53.11	49.00	44.17
Avg. abs. dry gas meter temp., deg. R	513	509	504
Total liquid collected by train, ml	288.9	276.5	229.5
Std. vol. of H2O vapor coll., cu.ft.	13.6	13.0	10.8
Dry gas meter calibration factor	1.002	1.002	1.002
Sample vol. at meter cond., dcf	158.264	157.762	145.159
Sample vol. at std. cond., dscf (1)	162.292	162.313	154.262
Percent of isokinetic sampling	104.0	104.2	106.1
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	5.7	5.8	6.1
O_2, % by volume, dry basis	12.1	11.9	11.9
CO, % by volume, dry basis	0.0	0.0	0.0
N_2, % by volume, dry basis	82.2	82.3	82.0
Molecular wt. of dry gas, lb/lb mole	29.4	29.4	29.5
H2O vapor in gas stream, prop. by vol.	0.077	0.074	0.065
Mole fraction of dry gas	0.923	0.926	0.935
Molecular wt. of wet gas, lb/lb mole	28.5	28.6	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-0.10	-0.10	-0.10
Static pressure, in. Hg	-0.007	-0.007	-0.007
Absolute pressure, in. Hg	29.72	29.58	30.27
Avg. temperature, deg. F	1546	1513	1493
Avg. absolute temperature, deg.R	2006	1973	1953
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	16.0	15.7	14.1
Stack/duct cross sectional area, sq.ft.	4.59	4.59	4.59
Avg. gas stream volumetric flow, wacf/min.	4400	4330	3870
Avg. gas stream volumetric flow, dscf/min. (1)	1060	1060	990
LABORATORY REPORT DATA(2)			
Hexavalent Chromium (Cr^{+6}), ug	58.94	61.19	45.37
HEXAVALENT CHROMIUM EMISSIONS			
Concentration, lb/dscf	8.01E-10	8.31E-10	6.48E-10
Concentration, ug/dscm	12.83	13.31	10.39
Mass emission rate, lb/hr	5.10E-05	5.29E-05	3.85E-05

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

(2) Per EPA Cr^{+6} method the laboratory results are blank corrected. A blank KOH value of 2.4 ug. per liter was used.

NOTE: The Cr^{+6} values reported above may not be truly representative. The Cr^{+6} values exceed the total chromium values obtained using the multi-metals test train. The Cr^{+6} test train has not been validated by EPA for use on sources exceeding 300° F.

APPENDIX I

SOURCE EMISSIONS LABORATORY ANALYTICAL DATA REPORTS WITHOUT RAW DATA

SOURCE EMISSIONS LABORATORY ANALYTICAL DATA REPORTS

SEMIVOLATILE ORGANICS (TRIANGLE LABORATORY)

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of

Semivolatile Hydrocarbons by

High-Resolution Gas Chromatography / Low-Resolution Mass Spectrometry

METHOD 8270A Rev. 1 (7/92)

Date : March 20, 1996

Client ID : Roy F. Weston

TLI Project Number : 36062A

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
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TRIANGLE LABORATORIES , INC.
CASE NARRATIVE

March 20, 1996
36062A

Objective: Analysis of three M23 dioxin extracts for Method 8270 Table 2 (TB2) semivolatile compounds and Tentatively Identified Compounds (TICs).

Method:

Two M23 train samples were received by Triangle Laboratories, Inc. on ice at 11°C on February 2, 1996. An additional three M23 train samples were received on February 6, 1996 at 4°C. all samples were received in good condition. The samples were stored in a cooler at 4°C prior to extraction. The M23 samples were extracted for the dioxin analysis. The resulting extracts were split 50:50 with fifty percent of each extract archived. Please note that this project contains the semivolatile analysis data for only three of the original five archived dioxin extracts. A method blank was prepared by utilizing one milliliter of toluene. Each extract was concentrated to a final volume of 1.0 mL for the semivolatile analysis. The analysis is based on the guidelines of Method 8270A Rev. 1 (7/92). The results reported relate only to the items tested.

The internal standards, 1,4-dichlorobenzene-d_4, naphthalene-d_8, acenaphthene-d_{10}, phenanthrene-d_{10}, chrysene-d_{12}, and perylene-d_{12} were added to the extracts such that the final internal standard concentration was 40 ug/mL immediately prior to analysis by GC/MS.

The GC/MS analysis conditions are listed below:

GC Conditions:	
Column:	J&W DB5-625, 30m x .32mm x 1*um*
Program:	35C, ramp at 12C/min to 285C, hold for 2 min. ramp at 8.5C/min to 315 C, hold for 6.5 min.
Carrier Gas:	Helium
MS Conditions:	
Instrument:	HP MSD, Chemsystem and Target data systems
Scan:	35-550 amu at 1.67 scan/sec
Interface:	Capillary, Injector: 250C, Detector: 275C

Report:

Enclosed with the case narrative are the sample identification index, project summary sheets, client and TLI chain of custody sheets, wet laboratory extraction information sheets, GC/MS tracking forms, and analytical run logs. The sample identification index correlates the client sample name, TLI sample number and the analytical file name for the each sample. The project summary sheets list the amounts of analytes detected in gray and list the estimated detection limits in parentheses for analytes which were not detected.

The data are reported as quantitation reports, chromatograms, interim reports, and spectra of detected target analytes and TICs. The quantitation report header lists the TLI project number, analysis method, instrument sample file name, and client sample name. The client project number, TLI sample number, calibration file, dilution factor, and date received, extracted, and analyzed are

also listed in the quantitation report header. The response factors used for all calculations are from the continuing calibration listed in the header. All initial and continuing calibration data are located in the back of the data package. The amount reported for each target analyte detected in the samples is reported in total ug. The retention time (RT) will be listed for all internal standards and analytes which are detected. If a target analyte is not detected, it will be flagged with a "U" and a detection limit will be listed. Estimated detection limits are calculated using an area of 10,000 for all analytes which were not found in the samples. The estimated detection limits reported are the average detection limits achievable over time on an instrument type. The actual detection limit for a given compound on a given day may vary from the estimate reported. The quantitation limit for all analytes is half of the low point of the initial calibration adjusted for dilution when appropriate. Below this point the calibration cannot be considered to be linear. Any amounts reported at a level below the quantitation limit will be flagged with a "J" and should be considered estimated. If a target analyte is found at a level exceeding the upper calibration limit, it will be flagged with an "E" and should also be considered estimated. Any analytes flagged with a "B" on the sample topsheets were detected in the associated laboratory blank. All target analytes are quantitated against the internal standard preceding them on the target analyte list.

In addition to the quantitation report, a tentatively identified compound report is also present. The TIC report includes the name, retention time, area, internal standard retention time and area, and the amount in total ug. The TIC amounts should be considered estimates because they are calculated using the total ion current areas of the internal standard. These TICs were searched against the NBS library and the best three matches were obtained. From this information a tentative identification was assigned. All of the spectral searches are included in the data package behind the spectra of target analytes.

Immediately following the TIC report are two pages which comprise the total ion chromatograms. Labeled internal and surrogate standards present in the sample have their identifications and retention time printed above their peak on the chromatogram. The chromatogram is followed by the interim report. On the interim report a $ is indicative of a surrogate standard and a * represents an internal standard. The interim report from the instrument is followed by the target spectra of detected compounds. Four spectral plots are included for each compound: a raw spectrum of the peak, a background subtracted version of the same spectrum, a library spectrum of the compound, and a plot showing the percent difference between the library spectrum and the background subtracted spectrum. Extracted ion current profiles are plotted on the right-hand side of the page showing the quantitation mass and one or two other prominent ions known to be present in target compound as they appear in the sample peak.

Results:

The extracts were analyzed within the Method 8270 holding times.

Please note that while Method 8270 Table 2 lists bis(2-chloroisopropyl)ether, this compound is not listed on the quantitation reports. The reports list 2,2'-oxybis(1-chloropropane) which is a structural isomer. These compounds coelute and are considered equivalent. Please note that the target analyte n-nitrosodiphenylamine cannot be distinguished from diphenylamine.

These dioxin extracts were reanalyzed per client request for Method 8270 Table 2 compounds. The dilution factors of two result from the dioxin extract split. It is important to note that Method 8270 nor 8270A do not specifically address air matrices. Likewise, the analytical columns used in semivolatile GC/MS are extremely sensitive to the compound toluene, which is present in dioxin extracts. The toluene peak can be seen in the sample chromatograms at approximately 4.5 minutes. Toluene may not be the solvent of choice for optimum semivolatile analyte extractions and therefore recoveries.

These samples were originally extracted for the dioxin analysis only, therefore no semivolatile surrogate standards were spiked onto these samples prior to extraction. There is no measurement for extraction efficiency as a result.

The internal standard areas for chrysene-d_{12} and perylene-d_{12} were above Method 8270 quality control limits in all samples except COE-HG-AFOUT-M23-R1. The internal standard area for perylene-d_{12} was above Method 8270 criteria in sample COE-HG-AFOUT-M23-R1. These internal standards are flagged with "IS High" and the amounts quantitated against them should be considered estimated.

Please note that one milliliter of toluene was used as the method blank because the archived portion of the laboratory blank extracted along side the samples had been used. An arbitrary dilution factor of two has been applied to this blank for the purposes of consistency. This blank renders no information in regards to the extraction process nor laboratory contamination potential at the actual time of the original extraction. No target analytes were detected in this blank.

The target analyte benzyl alcohol was found at amounts above the upper calibration limit of 320 micrograms. Per client request dilutions were not performed for this analyte.

The majority of TICs found in these samples were various aromatic compounds.

Sample Calculations:

$$\text{Response Factor, RF} = \frac{\text{Area analyte x Amt Is}}{\text{Area IS x Amt analyte}}$$

$$\text{Amount ug} = \frac{\text{Area analyte x Amt IS x DF}}{\text{Area IS x RF}}$$

$$\text{TIC Amount ug} = \frac{\text{Total Ion Current Area analyte x Amt IS x DF}}{\text{Total Ion Current Area IS}}$$

Where:

Amt IS = amount of internal standard = 40 ug
Amt analyte in the ccal = amount of analyte in the continuing calibration = 50 ug
DF = dilution factor

The data reported has been judged to be valid and in compliance with the guidelines of Method 8270A Rev. 1 (7/92) except as noted above. Should you have any questions about this project, please feel free to contact our Project Scientist, Selena Armistead, at (919) 544-5729 Ext. 269.

For Triangle Laboratories , Inc.,

Report Preparation:

Amy Wall 03/20/96

Report Preparation Chemist
Amy Wall

Quality Control:

Penny A. Brock 3/20/96

Report Preparation Chemist
Penny A. Brock

The total number of pages in this data package is 155.

Triangle Laboratories of RTP
Sample Identification Index for Project: 36062A

Client Id:	TLI Id:	File Name:
COE-HG-AFTOUT-M23-R1	113-204-1A-E	YL525
COE-HG-AFTOUT-M23-R2	113-217-1A-E	YL526
COE-HG-AFTOUT-M23-BT	113-217-3A-E	YL527
SBLK 020896	SBLK 020896	YL523

Triangle Laboratories of RTP
Project Summary for Project 36062A

Client ID:	COE-HG-AFT OUT-M23-R1	COE-HG-AFT OUT-M23-R2	COE-HG-AFT OUT-M23-BT	SBLK 02089 6
Filename :	YL525	YL526	YL527	YL523
TLI Id :	113-204-1A-E	113-217-1A-E	113-217-3A-E	SBLK 020896
Matrix :	M23	M23	M23	TOLUENE
Units :	ug	ug	ug	ug
Phenol	4.36	8.01	9.08	(2.87)
bis(2-Chloroethyl)ether	(4.00)	(3.81)	(3.72)	(3.42)
2-Chlorophenol	(2.40)	(2.29)	(2.24)	(2.06)
1,3-Dichlorobenzene	(2.04)	(1.94)	(1.90)	(1.75)
1,4-Dichlorobenzene	(1.95)	(1.86)	(1.81)	(1.67)
1,2-Dichlorobenzene	(2.09)	(1.99)	(1.95)	(1.79)
Benzyl alcohol	378.52	1521.61	2515.21	(6.51)
2,2′-oxybis(1-Chloropropane)	(4.11)	(3.92)	(3.83)	(3.52)
2-Methylphenol	(3.82)	(3.64)	(3.56)	(3.28)
3/4-Methylphenol	(3.76)	(3.59)	(3.50)	(3.23)
N-Nitroso-di-n-propylamine	(5.05)	(4.82)	(4.70)	(4.33)
Hexachloroethane	(4.09)	(3.89)	(3.80)	(3.50)
Nitrobenzene	(2.53)	(2.52)	(2.63)	(2.26)
Isophorone	(1.42)	(1.42)	(1.48)	(1.27)
2-Nitrophenol	(3.70)	(3.68)	(3.84)	(3.30)
2,4-Dimethylphenol	(3.12)	(3.10)	(3.24)	(2.78)
bis(2-Chloroethoxy)methane	(3.16)	(3.14)	(3.28)	(2.82)
Benzoic acid	50.02	66.93	48.28	(3.72)
2,4-Dichlorophenol	(2.66)	(2.64)	(2.76)	(2.37)
1,2,4-Trichlorobenzene	(2.16)	(2.15)	(2.24)	(1.93)
Naphthalene	1.34	1.63	1.64	(0.76)
4-Chloroaniline	(2.05)	(2.04)	(2.13)	(1.83)
Hexachlorobutadiene	(2.60)	(2.59)	(2.70)	(2.32)
4-Chloro-3-methylphenol	(3.25)	(3.23)	(3.38)	(2.90)
2-Methylnaphthalene	(1.26)	(1.25)	(1.31)	(1.13)
Hexachlorocyclopentadiene	(2.34)	(2.30)	(2.35)	(2.12)
2,4,6-Trichlorophenol	(2.92)	(2.87)	(2.93)	(2.65)
2,4,5-Trichlorophenol	(2.82)	(2.78)	(2.83)	(2.55)
2-Chloronaphthalene	(1.17)	(1.15)	(1.17)	(1.06)
2-Nitroaniline	(4.32)	(4.25)	(4.33)	(3.91)
Dimethylphthalate	(0.96)	(0.95)	(0.96)	(0.87)
2,6-Dinitrotoluene	(4.13)	(4.07)	(4.14)	(3.74)
2,4-Dinitrotoluene	(2.69)	(2.65)	(2.70)	(2.44)
Acenaphthylene	(0.75)	(0.74)	(0.75)	(0.68)
3-Nitroaniline	(3.76)	(3.69)	(3.76)	(3.40)

( )-Estimated Detection Limit

Triangle Laboratories of RTP, Inc.
801 Capitola Drive • Durham, North Carolina 27713
Phone: (919) 544-5729 • Fax: (919) 544-5491

Triangle Laboratories of RTP
Project Summary for Project 36062A

Client ID:	COE-HG-AFT OUT-M23-R1	COE-HG-AFT OUT-M23-R2	COE-HG-AFT OUT-M23-BT	SBLK 02089 6
Filename :	YL525	YL526	YL527	YL523
TLI Id :	113-204-1A-E	113-217-1A-E	113-217-3A-E	SBLK 020896
Matrix :	M23	M23	M23	TOLUENE
Units :	ug	ug	ug	ug
Acenaphthene	(1.34)	(1.32)	(1.34)	(1.21)
2,4-Dinitrophenol	(8.53)	(8.39)	(8.55)	(7.72)
4-Nitrophenol	(4.05)	(3.99)	(4.06)	(3.67)
Dibenzofuran	(0.78)	(0.77)	(0.78)	(0.71)
Diethylphthalate	7.80	3.61	1.29	(0.67)
4-Chlorophenyl-phenylether	(1.86)	(1.83)	(1.86)	(1.68)
Fluorene	(1.02)	(1.00)	(1.02)	(0.92)
4-Nitroaniline	(3.68)	(3.62)	(3.68)	(3.33)
4,6-Dinitro-2-methylphenol	(4.65)	(4.44)	(4.56)	(4.77)
N-Nitrosodiphenylamine	(1.50)	(1.43)	(1.47)	(1.53)
4-Bromophenyl-phenylether	(2.15)	(2.06)	(2.11)	(2.21)
Hexachlorobenzene	(1.54)	(1.47)	(1.51)	(1.58)
Pentachlorophenol	(2.69)	(2.57)	(2.64)	(2.76)
Phenanthrene	(0.59)	(0.56)	(0.58)	(0.60)
Anthracene	0.35	(0.57)	(0.58)	(0.61)
Di-n-butylphthalate	21.48	15.26	8.30	(0.35)
Fluoranthene	(0.45)	(0.43)	(0.44)	(0.46)
Pyrene	(0.33)	(0.30)	(0.30)	(0.32)
Butylbenzylphthalate	0.39	(0.53)	(0.52)	(0.57)
3,3'-Dichlorobenzidine	(0.94)	(0.85)	(0.84)	(0.92)
bis(2-Ethylhexyl)phthalate	16.27	18.01	4.49	(0.42)
Benzo(a)anthracene	(0.35)	(0.32)	(0.31)	(0.34)
Chrysene	(0.38)	(0.34)	(0.34)	(0.37)
Di-n-octylphthalate	(0.25)	(0.28)	(0.31)	(0.24)
Benzo(b)fluoranthene	(0.34)	(0.39)	(0.42)	(0.33)
Benzo(k)fluoranthene	(0.35)	(0.40)	(0.43)	(0.34)
Benzo(a)pyrene	(0.35)	(0.40)	(0.43)	(0.34)
Indeno(1,2,3-cd)pyrene	(0.36)	(0.40)	(0.44)	(0.35)
Dibenz(a,h)anthracene	(0.48)	(0.53)	(0.58)	(0.46)
Benzo(g,h,i)perylene	(0.42)	(0.47)	(0.51)	(0.40)

( )-Estimated Detection Limit

Triangle Laboratories of RTP, Inc.
801 Capitola Drive • Durham, North Carolina 27713
Phone: (919) 544-5729 • Fax: (919) 544-5491

Savar v3.5
Printed: 17:26:49 03/20/96

WESTON Analytics Use Only

PCDD/PCDF

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client CDE HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # Jeff O'Neill 610-701-7201
AD Project Manager Selena Armistead
QC: STD Del STD TAT
Date Rec'd ______ Date Due ______
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

EPA Method 23 (PCDD/PCDF)

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	EPA Method 23 (PCDD/PCDF)	
	CDE-H6-APTOUT-M23-R1-F/HS				1/31/96		X	Run One
	CDE-H6-APTOUT-M23-R1-FILT						X	
	CDE-H6-APTOUT-M23-R1-XAD						X	
	CDE-H6-APTOUT-M23-R1-B/HS						X	
	CDE-H6-APTOUT-M23-R1-TOL						X	
	CDE-H6-OUT-M23-SB-ALE/RCM				1/31/96		X	Site Blanks
	CDE-H6-OUT-M23-SB-FILT						X	
	CDE-H6-OUT-M23-SB-XAD						X	
	CDE-H6-OUT-M23-SB-TOL						X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Analyze site blank only if contamination found in blank train sample.

DATE/REVISIONS:
1. Combine toluene
2. with other train
3. fractions for
4. total run composite
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time
	John Smith	2/1/96	12:00

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381-596a

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WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Client ____
Est. Final Proj. Sampling Date ____
Work Order # ____
Project Contact/Phone # ____
AD Project Manager ____
QC ____ Del ____ TAT ____
Date Rec'd ____ Date Due ____
Account # ____

Refrigerator #		
#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb	INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb					Metal	CN						
	[illegible]				[illegible]	[illegible]																
	[illegible]																					
	[illegible]																					
	[illegible]																					
	[illegible]																					
	[illegible]				[illegible]	[illegible]																
	[illegible]																					
	[illegible]																					
	[illegible]																					
	[illegible]																					

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
____ 1. ____
____ 2. ____
____ 3. ____
____ 4. ____
____ 5. ____
____ 6. ____

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON. MANAGERS DESIGNERS/CONSULTANTS

Page ___ of ___

Client ___
Est. Final Proj. Sampling Date ___
Work Order # ___
Project Contact/Phone # ___
AD Project Manager ___
QC ___ Del ___ TAT ___
Date Rec'd ___ Date Due ___
Account # ___

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

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Custody Seal : Absent Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Absent	TLI Project Number: 36049	Book 113
		Client: RFW01 — Roy F. Weston. Inc.	
		Date Received 02/02/96 By J Guenther	Page 204
Box	ICE Temp 11.0 C	Carrier and Number FedEx/2350390884	

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-204-1A	COE-HG-AFTOUT-M23-R1-FILT	FILTER C01	2/07/96 SBM	Empty						
113-204-1B	COE-HG-AFTOUT-M23-R1-XAD	XAD C01								
113-204-1C	COE-HG-AFTOUT-M23-R1-FHS	FH/RINSE C01								
113-204-1D	COE-HG-AFTOUT-M23-R1-BHS	BH/RINSE C01								
113-204-1E	COE-HG-AFTOUT-M23-R1-TOL	TOLUENE C01								
113-204-2A	COE-HG-OUT-M23-S8-FILT	FILTER C01								
113-204-2B	COE-HG-OUT-M23-S8-XAD	XAD C01								
113-204-2C	COE-HG-OUT-M23-S8-ACE/DCM	ACE/MECL2 C01								
113-204-2D	COE-HG-OUT-M23-S8-TOL	TOLUENE C01								

Receiving Remarks: Samples received 2/2/96. logged in 2/4/96.

Archive Remarks:

TRIANGLE LABORATORIES. INC.--CHAIN OF CUSTODY--REVISED 02/17/95

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DS 3.20.98

Custody Seal : Present/Intact Sample Seals: Present	TLI Project Number	36062	Book
Chain of Custody : Present	Client: RFW01	Roy F. Weston. Inc.	113
Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Date Received	02/06/96 By	Page
Ice Chest ICE Temp 4.0 C	Carrier and Number	FedEx/	217

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-1A	COE-HG-AFTOUT-M23-R2-C01	FILTER	2/07 RC sbm	Empty						
113-217-1B	COE-HG-AFTOUT-M23-R2-C01	XAD								
113-217-1C	COE-HG-AFTOUT-M23-R2-C01	FH/RINSE								
113-217-1D	COE-HG-AFTOUT-M23-R2-C01	BH/RINSE								
113-217-1E	COE-HG-AFTOUT-M23-R2-C01	TOLUENE								
113-217-2A	COE-HG-AFTOUT-M23-R3-C01	FILTER								
113-217-2B	COE-HG-AFTOUT-M23-R3-C01	XAD								
113-217-2C	COE-HG-AFTOUT-M23-R3-C01	FH/RINSE								
113-217-2D	COE-HG-AFTOUT-M23-R3-C01	BH/RINSE								
113-217-2E	COE-HG-AFTOUT-M23-R3-C01	TOLUENE								

Receiving Remarks:

13

Archive Remarks:

~~12~~

Custody Seal : Present/Intact Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Present	TLI Project Number	36062	Book
		Client: RFW01	Roy F. Weston, Inc.	113
		Date Received	02/06/96 By	Page
Ice Chest	ICE Temp 4.0 C	Carrier and Number	FedEx/	217

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-3A	COE-HG-AFTOUT-M23-BT-	FILTER C01	2/07/96 sbm	Empty						
113-217-3B	COE-HG-AFTOUT-M23-BT-	XAD C01								
113-217-3C	COE-HG-AFTOUT-M23-BT-	FH/RINSE C01								
113-217-3D	COE-HG-AFTOUT-M23-BT-	BH/RINSE C01								
113-217-3E	COE-HG-AFTOUT-M23-BT-	TOLUENE C01								

Receiving Remarks:

Archive Remarks:

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36062

(3) Pre-spiked XAD clean

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96 TLI BLANK
SPIKE .Ong USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

(1) XAD-clean, 1Filter-clean 1g glass wool-clean

RFW01-Roy F. Weston. Inc.
COE-HG-AFTOUT-M23-R1-XAD
Project:36049
113-204-1B

RFW01-Roy F. Weston. Inc.
COE-HG-AFTOUT-M23-R1-FILT
Project:36049
113-204-1A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .Ong USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

Client COE - HOT GAS
Plant ALPINE, AL
Source AFTERBURNER OUTLET
Date 1/96
Run No. 1
Sample Method METHOD 23 PCDD/PCDF
Sample Type

(2) XAD-clean, 1Filter-clean 1g glass wool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R2-
Project:36062
113-217-1B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R2-
Project:36062
113-217-1A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .Ong USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

36062

3) XAD-clean, 1 Filter-clean, glasswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R3-
Project:36062
113-217-2B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23 -R3-
Project:36062
113-217-2A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

4) XAD-clean, 1 Filter-clean, glasswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-BT-
Project:36062
113-217-3B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-BT-
Project:3606
113-217-3A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

5) 1 Filter clean, XAD-clean, glasswool-clean

-W01-Roy F. Weston, Inc.
COE-HG-OUT-M23-SB-XAD
Project:36049
113-204-2B

RFW01-Roy F. Wes... ...on, Inc.
COE-HG-OUT-M23-S... ...B-FILT
Project:36049
113-204-2A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMR
PREPARER G.L.

-TERRA
THE BLANK
MERCURY
XAD

1

~~16~~

CMR 1.10.96

17

Date: 02/10/96
Time: 18:31

TRIANGLE LABORATORIES, INC.
Wet Lab MM5/PUF Observations
Project: 36062

PRDPERC v3.17
Page: 1

Sample #	crd	TLI_Number..	Customer.Sample.Id.......	F. No	XAD Color.....	Filter Color.....	Glass Wool Color.....	PUF Color.....	Odor.....	Air Q.No.	Entered.By......	Date....	Time....	S
000		TLI Blank	TLI M23 Blank	0	clean					02518	mercer	02/08	01:19	F
001		113-204-1A-E	COE-HG-AFTOUT-M23-R1	1	clean	cream	clean			02518	mercer	02/08	01:19	F
002		113-217-1A-E	COE-HG-AFTOUT-M23-R2	1	clean	cream	clean			02518	mercer	02/08	01:19	F
003		113-217-2A-E	COE-HG-AFTOUT-M23-R3	1	clean	cream	clean			02518	mercer	02/08	01:19	F
004		113-217-3A-E	COE-HG-AFTOUT-M23-BT	1	clean	clean	clean			02518	mercer	02/08	01:19	F
005		113-204-2A-D	COE-HG-OUT-M23-SB	1	clean	clean	clean			02518	mercer	02/08	01:19	F

*** End of Report ***

TRIANGLE LABORATORIES, INC.

PCDD/PCDF/PBDD/PBDF Sample Preparation Tracking & Management Form

Client: Roy F. Weston, Inc. (RFW01)

Project: 36062

Method: Method 23: T-O, Toluene Combined

Sample Information:

Extraction Date: 2/07/96

Spiking Dates: 2/07/96 2/8/96 __/__/__ __/__/__

SBm SBm

WL Spike: 40 µl, conc: 0.100 ng/µl

S#.crd	TLI SAMPLE ID / CLIENT SAMPLE ID	GROSS WEIGHT Before	After	SAMPLE SIZE g / ml	USF-I Ex/Cl Initials 40 µl	USF-A Ex/Cl Initials 40 µl	MISC Ex/Cl Initials	USFMX Extr. Initials	Sample Left ? Yes/No
000	TLI Blank / TLI M23 Blank								Y/2
001	113-204-1A-E / COE-HG-AFTOUT-M23-R1								Y/2
002	113-217-1A-E / COE-HG-AFTOUT-M23-R2								Y/2
003	113-217-2A-E / COE-HG-AFTOUT-M23-R3								Y/2
004	113-217-3A-E / COE-HG-AFTOUT-M23-BT								Y/2
005	113-204-2A-D / COE-HG-OUT-M23-SB								Y/2

Gross weight of sample container + sample before/after aliquot removal

#005 Extract and HoLD

COMMENTS:

Initial/Date SBm 2/07/96

Indicate below the TLI Identification Number of the Sample Fortification Solutions:

USF-AIS: ______

USF-I: 33456 0.1 ug/ml Exp. 11/26/96 USF-A: 34964 exp 11/96 0.1 ug/ml

USF-ACS: ______ USF-MX: ______

USF-C: ______ Other: ______

LOT # (Solvents): Toluene 950743

for extraction: ______

INITIALS OF BOTH THE SPIKER AND OBSERVER MUST BE ENTERED.

(XXXXX = Gross Weight not provided for WATER Samples.)

TRIANGLE LABORATORIES, INC.
SAMPLE EXTRACTION and CLEANUP TRACKING FORM
TLI Project: 36062

	EXTRACTION			CHROMATOGRAPHIC CLEANUP							
Ext S#.crd and TLI Number	Spike before Extr. ✓	Extr. ✓	Spike after Extr. ✓	Acid Base	Big Fish	Escltd Silica Gel ✓	Acid Almina 6 gm ✓	Flor-isil	Carbon Column ✓	Trans-fer ✓	Add'l Clean-up
000 TLI Blank	~~SBM~~ SDD 2/07/96	SBM 2/07/96	SBM JDD					DSP 2/8		2/10/96	
001 113-204-1A-E											
002 113-217-1A-E											
003 113-217-2A-E											
004 113-217-3A-E											
005 113-204-2A-D			✓ 2-8-96					EBM 2/9/96		DS	

...PROCEDURE....	......DETAILS......	Performed.By	Observed.By	....DATE....
Spike		SBM	JDD	2/07/96
Soxhelet Ext.		SBM		2/07/96
Rotovap	40mL, 10mL, Dryness	JDD		2/8/96
Combine		N/A		/ /
Divide	50:50	JDD		2/8/96
Solvent Exchange				/ /
Add Tridecane	*JDD	~~EED JDD~~		2/8/96

Comments: Tridecane needs to be added after extraction
*Tridecane was Added JDD 2-8-96

Rev 01/25/96 (PSTMF 4)

SAMPLE PREPARATION LABORATORY
SAMPLE EXTRACTION AND CLEANUP TRACKING FORM
ORGANIC WET LABORATORY

TL-RTP Project Number: 36062A

Sample No.	Step Number and Decsription	Initial	Date	Time
B	blank (archived portion) was used already,	SBm	3/6/96	
	clean Toluene was used as the blank			
	only one ~~millit~~ milliliter of toluene was used for blank EESB 3/6/96			
1-3	N_2 to 10ml Toluene to 1ml			
	Transfer to ½ dram vial			
1-3	N_2 to 1ml	MK	3/7/96	
	Reling to MS	MK	3/7/96	

Water Bath Temperature:
Total Hours:
Comments: * Blank - clean Toluene only

rev 02 01/25/93

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 36062-A

Transfer From: OWLS5 To: OMSSV

	Initials..	Date.......	Time...
Released by:	MK	3/07/96	1:00 PM
Accepted by:	DO	3/7/96	13:00

MILES.ID........		TLI_No......	Cust.Id..................
36062-A	-000	TLI Blank	TLI M23 Blank
36062-A	-001	113-204-1A-E	COE-HG-AFTOUT-M23-R1
36062-A	-002	113-217-1A-E	COE-HG-AFTOUT-M23-R2
36062-A	-003	113-217-3A-E	COE-HG-AFTOUT-M23-BT

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

SEMIVOLATILE GC/MS TRACKING FORM

TL-RTP Project #: 3L062A

MATRIX: MM5 PUF Water Soil Other ____________

METHOD: 8270 625 CLP

ANALYTE LIST: Table 2 TCLP 625 CLP CAA/PAP PAH CB/CP Other ____________

ICAL Name: ICAL Y304

Date	Time	TLRTP ID	Sample ID	File Name	Comments
3/8/96	0808	3867	DFTPP	YL515	
	1103	3365	SSTD050	YL518	
	1203	–	SBLK 020896	YL519	IS 5&6 high
	1454	–	SBLK 020896	YL523	IS 5&6 high
	1621	113.200 1A-E	30E HG-AFTOUT-M23-R1	YL525	IS 6 high
	1706	113.217.1A-E	30E HG-AFTOUT-M23-R2	YL526	IS 5&6 high
	1747	113.217.3A-E	30E HG-AFTOUT-M23-BT	YL527	IS 5&6 high

TRIANGLE LABORATORIES OF RTP, INC.

TRIANGLE LABORATORIES OF RTP, INC. RUN LOG

S#	COLUMN TYPE	COLUMN #	ANALYSIS	ACQ METHOD	GC METHOD	FIND DB'S	OTHER
1	DBS-625	3315023		cclist.m		1.	
						2.	

EXTRACT / SAMPLE VOLUME 100 uL / mL

DATE	TIME	PROJECT #	SAMPLE #	CLIENT SAMPLE ID	FILENAME	OPER	BACKUP NET	BACKUP ARC	PROC	pH	COMMENTS
3/4/96	14:22	—	2867	DFTPP	YL460	RKO			RKO		passed
3/4/96	14:41	—	3365	SSTDCC50	YL461	DD			RKO		Failed - phenols out
3/4/96	15:41	—	3365	SSTD050	YL462	RKO			RKO		Changed liner, cut off 21 inches of column - Failed - Ran ICAL
3/4/96	16:37	—	3362	SSTD160	YL463	RKO			RKO		
3/4/96	17:13	—	3363	SSTD120	YL464	RKO			RKO		
3/4/96	1757	—	3364	SSTD080	YL465	RKO			DD		
3/4/96	1842	—	3366	SSTD020	YL466	RKO			DD		
3/4/96	1926	36400	—	SBLK030196	YL467	RKO			DD		
3/4/96	2009	36400	115-55-1A	0228-CV1	YL468	RKO			DD		
3/4/96	2053	36295	114-199-4-I	Outlet Stack Run 1	YL469	RKO			DD		Targets over calib. range diluted 10x

PAGE #	33	

INTERNAL STANDARD	SURROGATE STANDARD	ANALYTE STANDARD
3397C exp 6/13/96 Sulot 834 2/3/96		

TRIANGLE LABORATORIES OF RTP, INC. RUN LOG

24

IS#	COLUMN TYPE	COLUMN #	ANALYSIS	ACQ METHOD	GC METHOD	FIND DB'S	OTHER
Y	DB5-625	2 ~~8~~515023		cclist.m		1.	
						2.	

EXTRACT / SAMPLE VOLUME 100 uL mL

DATE	TIME	PROJECT #	SAMPLE #	CLIENT SAMPLE ID	FILENAME	OPER	BACKUP NET	BACKUP ARC	PROC	pH	COMMENTS
3/8/96	0808	—	2867	DFTPP	YL515	DD			DD		cut off 3 ft column passed
3/8/96	0839	—	3365	SSTD050	YL516	DD			DD		failed Benzyl alcohol >50%D
3/8/96	0958	—	3365	SSTD050	YL517	DD			DD		cut off 1½ ft column failed - benzyl alcohol >50%D
3/8/96	1103	—	3365	SSTD050	YL518	DD			DD		Cut off 2 ft. column passed
3/8/96	1203	360062A	—	SBLK 020896	YL519	DD			DD		IS 5-6 high
3/8/96	1238	36317F	—	SBLK 030496	YL520	DD			DD		
3/8/96	1324	36319F	—	SBLK 030396	YL521	DD			DD		
3/8/96	1411	36376B	—	SBLK 030196	YL522	DD			DD		di-n-butylphthalate @ 172ng Benzoic acid @ 113ng.
		~~36376B~~	~~113.31.3A F~~	3 96-27=MMS-BLANK ~~96-2~~ TRAN	YL523	DD					ee DD 3/8/96
		~~360062A~~	~~113.204.1A-E~~	1 ~~CDC-HG-AFTOUT-M23-R1~~	YL524	DD					ee DD 3/8/96

ee DD 3/11/96

PAGE	INTERNAL STANDARD	SURROGATE STANDARD	ANALYTE STANDARD
39	3391D EXP 6/13/96 5µl @ 834 ng/ml		

TRIANGLE LABORATORIES OF RTP, INC. RUN LOG

IS#	COLUMN TYPE	COLUMN #	ANALYSIS	ACQ METHOD	GC METHOD	FIND DB'S	OTHER
Y	DB5625	2515023		cclist.m		1.	
						2.	

EXTRACT / SAMPLE VOLUME 100 uL / mL

DATE	TIME	PROJECT #	SAMPLE #	CLIENT SAMPLE ID	FILENAME	OPER	BACKUP NET	BACKUP ARC	PROC	pH	COMMENTS
3/8/96	1454	36062A	–	SBLK 020896	EE DD 3/8/96 ~~ZC~~ YL523	DD			DD		IS 5% high
3/8/96	1537	36376B	115.31.3A-F	96-27=MMS-BLANK TRAIN	YL524	DD			DD		
3/8/96	1621	36062A	113.204.1A-E	COE-HG-AFTOUT-M23-R1	YL525	DD			DD		
3/8/96	1705	36062A	113.217.1A-E ~~113.204.2A-E~~ EE DD 3/8/96	COE-HG-AFTOUT-M23-R2	YL526	DD			DD		
3/8/96	1747	36062A	113.217.3A-E	COE-HG-AFTOUT-M23-BT ~~R3~~ EE DD 3/8/96	YL527	DD			DD		
3/8/96	1831	36317F	114.222.2A-B EE DD 3/8/96	BS-02	YL528	DD			DD		(Diluted 5x)(BN+A fractions) Final DF=10X phenol above cal. rar
3/8/96	1918	36376B	115.31.1A-F	96-27=MMS-RUN#1	YL529	DD			DD		Diluted 5X
3/8/96	1959	36376B	115.31.2A-F	96-27=MMS-RUN#2	YL530	DD			DD		Diluted 5X
3/8/96	2042	36319F	114.224.1	30% A-NY-1	YL531	DD			DD		Diluted 10X OFF CLOCK
3/8/96	2124	36319F	114.224.2	30% B-NY-2	YL532	DD			DD		Diluted 10X

PAGE		
	41	

INTERNAL STANDARD	SURROGATE STANDARD	ANALYTE STANDARD
3317 D Exp 6/13/96 5ul @834 ug/ml		

ROY F. WESTON

Project Number: 36062A
Sample File: YL525

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R1

Client Project: COE HOT GAS PRG	Date Received: 02/02/96	Response File: YL518
TLI ID: 113-204-1A-E	Date Extracted: 02/07/96	
	Date Analyzed : 03/08/96	

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
1,4-Dichlorobenzene-d_4		IS 1	9.09		
Phenol	4.36	J	8.46		20
bis(2-Chloroethyl)ether		U		4.00	20
2-Chlorophenol		U		2.40	20
1,3-Dichlorobenzene		U		2.04	20
1,4-Dichlorobenzene		U		1.95	20
1,2-Dichlorobenzene		U		2.09	20
2,2'-oxybis(1-Chloropropane)		U		4.11	20
Benzyl alcohol	378.52	E	9.37		20
2-Methylphenol		U		3.82	20
3/4-Methylphenol		U		3.76	20
N-Nitroso-di-n-propylamine		U		5.05	20
Hexachloroethane		U		4.09	20
Naphthalene-d_8		IS 2	11.56		
Nitrobenzene		U		2.53	20
Isophorone		U		1.42	20
2-Nitrophenol		U		3.70	20
2,4-Dimethylphenol		U		3.12	20
bis(2-Chloroethoxy)methane		U		3.16	20
Benzoic acid	50.02		11.07		50
2,4-Dichlorophenol		U		2.66	20
1,2,4-Trichlorobenzene		U		2.16	20
Naphthalene	1.34	J	11.61		20
4-Chloroaniline		U		2.05	20
Hexachlorobutadiene		U		2.60	20
4-Chloro-3-methylphenol		U		3.25	20

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL525

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R1

Client Project: COE HOT GAS PRG
TLI ID: 113-204-1A-E
Date Received: 02/02/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96
Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
2-Methylnaphthalene		U		1.26	20
Acenaphthene-d_{10}		IS 3	15.16		
Hexachlorocyclopentadiene		U		2.34	20
2,4,6-Trichlorophenol		U		2.92	20
2,4,5-Trichlorophenol		U		2.82	20
2-Chloronaphthalene		U		1.17	20
2-Nitroaniline		U		4.32	50
Dimethylphthalate		U		0.96	20
2,6-Dinitrotoluene		U		4.13	20
2,4-Dinitrotoluene		U		2.69	20
Acenaphthylene		U		0.75	20
3-Nitroaniline		U		3.76	50
Acenaphthene		U		1.34	20
2,4-Dinitrophenol		U		8.53	50
4-Nitrophenol		U		4.05	50
Dibenzofuran		U		0.78	20
Diethylphthalate	7.80	J	16.12		20
4-Chlorophenyl-phenylether		U		1.86	20
Fluorene		U		1.02	20
4-Nitroaniline		U		3.68	50
Phenanthrene-d_{10}		IS 4	18.21		
4,6-Dinitro-2-methylphenol		U		4.65	50
N-Nitrosodiphenylamine		U		1.50	20
4-Bromophenyl-phenylether		U		2.15	20
Hexachlorobenzene		U		1.54	20
Pentachlorophenol		U		2.69	50

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ROY F. WESTON

Project Number: 36062A
Sample File: YL525

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R1

Client Project: COE HOT GAS PRG
TLI ID: 113-204-1A-E

Date Received: 02/02/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
Phenanthrene		U		0.59	20
Anthracene	0.35	J	18.26		20
Di-n-butylphthalate	21.48		19.53		20
Fluoranthene		U		0.45	20
Chrysene-d_{12}		IS 5	23.67		
Pyrene		U		0.33	20
Butylbenzylphthalate	0.39	J	22.62		20
3,3'-Dichlorobenzidine		U		0.94	20
bis(2-Ethylhexyl)phthalate	16.27	J	23.83		20
Benzo(a)anthracene		U		0.35	20
Chrysene		U		0.38	20
Perylene-d_{12}		IS 6 High	27.30		
Di-n-octylphthalate		U		0.25	20
Benzo(b)fluoranthene		U		0.34	20
Benzo(k)fluoranthene		U		0.35	20
Benzo(a)pyrene		U		0.35	20
Indeno(1,2,3-cd)pyrene		U		0.36	20
Dibenz(a,h)anthracene		U		0.48	20
Benzo(g,h,i)perylene		U		0.42	20

Reviewed by m Date 03/20/96

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ROY F. WESTON

Project Number: 36062A
Sample File: YL525

Method 8270A
Sample ID COE-HG-AFTOUT-M23-R1

Client Project:	COE HOT GAS PRG	Date Received:	02/02/96
TLI ID:	113-204-1A-E	Date Extracted:	02/07/96
		Date Analyzed:	03/08/96

Dilution Factor: 2

Tentatively Identified Compounds

Name	RT	Area	IS RT	IS Area	Amount, ug
Benzaldehyde	8.301	25244264	9.095	1851062	1091
Substituted Benzaldehyde	11.244	332237	11.563	2174095	12
Substituted Alkane	12.895	1491038	11.563	2174095	55
Triacetin	13.292	2811989	11.563	2174095	103
Aromatic Ketone	13.420	393112	15.156	2711062	12
Bibenzyl	15.553	1853983	15.156	2711062	55
Benzophenone	16.672	302264	15.156	2711062	9
Substituted Amide	25.851	1409359	27.295	5248717	21

Triangle Laboratories of RTP, Inc.
801 Capitola Drive * Durham, North Carolina 27713
Phone: (919) 544-5729 * Fax: (919) 544-5491

Printed: 17:37 03/20/96

ROY F. WESTON

Project Number: 36062A
Sample File: YL526

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R2

Client Project: COE HOT GAS PRG
TLI ID: 113-217-1A-E

Date Received: 02/06/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
1,4-Dichlorobenzene-d_4		IS 1	9.10		
Phenol	8.01	J	8.46		20
bis(2-Chloroethyl)ether		U		3.81	20
2-Chlorophenol		U		2.29	20
1,3-Dichlorobenzene		U		1.94	20
1,4-Dichlorobenzene		U		1.86	20
1,2-Dichlorobenzene		U		1.99	20
2,2'-oxybis(1-Chloropropane)		U		3.92	20
Benzyl alcohol	1521.61	E	9.39		20
2-Methylphenol		U		3.64	20
3/4-Methylphenol		U		3.59	20
N-Nitroso-di-n-propylamine		U		4.82	20
Hexachloroethane		U		3.89	20
Naphthalene-d_8		IS 2	11.57		
Nitrobenzene		U		2.52	20
Isophorone		U		1.42	20
2-Nitrophenol		U		3.68	20
2,4-Dimethylphenol		U		3.10	20
bis(2-Chloroethoxy)methane		U		3.14	20
Benzoic acid	66.93		11.09		50
2,4-Dichlorophenol		U		2.64	20
1,2,4-Trichlorobenzene		U		2.15	20
Naphthalene	1.63	J	11.61		20
4-Chloroaniline		U		2.04	20
Hexachlorobutadiene		U		2.59	20
4-Chloro-3-methylphenol		U		3.23	20

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IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL526

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R2

Client Project: COE HOT GAS PRG
TLI ID: 113-217-1A-E
Date Received: 02/06/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96
Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
2-Methylnaphthalene		U		1.25	20
Acenaphthene-d_{10}		IS 3	15.15		
Hexachlorocyclopentadiene		U		2.30	20
2,4,6-Trichlorophenol		U		2.87	20
2,4,5-Trichlorophenol		U		2.78	20
2-Chloronaphthalene		U		1.15	20
2-Nitroaniline		U		4.25	50
Dimethylphthalate		U		0.95	20
2,6-Dinitrotoluene		U		4.07	20
2,4-Dinitrotoluene		U		2.65	20
Acenaphthylene		U		0.74	20
3-Nitroaniline		U		3.69	50
Acenaphthene		U		1.32	20
2,4-Dinitrophenol		U		8.39	50
4-Nitrophenol		U		3.99	50
Dibenzofuran		U		0.77	20
Diethylphthalate	3.61	J	16.13		20
4-Chlorophenyl-phenylether		U		1.83	20
Fluorene		U		1.00	20
4-Nitroaniline		U		3.62	50
Phenanthrene-d_{10}		IS 4	18.21		
4,6-Dinitro-2-methylphenol		U		4.44	50
N-Nitrosodiphenylamine		U		1.43	20
4-Bromophenyl-phenylether		U		2.06	20
Hexachlorobenzene		U		1.47	20
Pentachlorophenol		U		2.57	50

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IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL526

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-R2

Client Project: COE HOT GAS PRG
TLI ID: 113-217-1A-E

Date Received: 02/06/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
Phenanthrene		U		0.56	20
Anthracene		U		0.57	20
Di-n-butylphthalate	15.26	J	19.53		20
Fluoranthene		U		0.43	20
Chrysene-d_{12}		IS 5 High	23.67		
Pyrene		U		0.30	20
Butylbenzylphthalate		U		0.53	20
3,3'-Dichlorobenzidine		U		0.85	20
bis(2-Ethylhexyl)phthalate	18.01	J	23.83		20
Benzo(a)anthracene		U		0.32	20
Chrysene		U		0.34	20
Perylene-d_{12}		IS 6 High	27.29		
Di-n-octylphthalate		U		0.28	20
Benzo(b)fluoranthene		U		0.39	20
Benzo(k)fluoranthene		U		0.40	20
Benzo(a)pyrene		U		0.40	20
Indeno(1,2,3-cd)pyrene		U		0.40	20
Dibenz(a,h)anthracene		U		0.53	20
Benzo(g,h,i)perylene		U		0.47	20

Reviewed by m Date 03/20/96

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number:	36062A	Method 8270A	
Sample File:	YL526	Sample ID COE-HG-AFTOUT-M23-R2	
Client Project:	COE HOT GAS PRG	Date Received:	02/06/96
TLI ID:	113-217-1A-E	Date Extracted:	02/07/96
		Date Analyzed:	03/08/96
	Dilution Factor:	2	

Tentatively Identified Compounds

Name	RT	Area	IS RT	IS Area	Amount, ug
Benzaldehyde	8.329	66249179	9.096	1927605	2749
Alkylbenzene	10.126	206466	9.096	1927605	9
Substituted Benzene	11.014	11103797	11.567	2251279	395
Substituted Benzaldehyde	11.248	494096	11.567	2251279	18
Substituted Benzene	11.489	234228	11.567	2251279	8
Alkyl Methyl Ester Benzoic Acid	12.907	274833	11.567	2251279	10
Aromatic Ketone	13.417	549478	15.154	2779875	16
Bibenzyl	15.558	7177058	15.154	2779875	207
Benzophenone	16.664	639684	15.154	2779875	18
Substituted Amide	25.847	1154626	27.287	4621595	20

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Phone: (919) 544-5729 * Fax: (919) 544-5491

Printed: 17:36 03/20/96

ROY F. WESTON

Project Number: 36062A
Sample File: YL527

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-BT

Client Project: COE HOT GAS PRG
TLI ID: 113-217-3A-E

Date Received: 02/06/96
Date Extracted: 02/07/96
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
1,4-Dichlorobenzene-d_4		IS 1	9.10		
Phenol	9.08	J	8.46		20
bis(2-Chloroethyl)ether		U		3.72	20
2-Chlorophenol		U		2.24	20
1,3-Dichlorobenzene		U		1.90	20
1,4-Dichlorobenzene		U		1.81	20
1,2-Dichlorobenzene		U		1.95	20
2,2'-oxybis(1-Chloropropane)		U		3.83	20
Benzyl alcohol	2515.21	E	9.39		20
2-Methylphenol		U		3.56	20
3/4-Methylphenol		U		3.50	20
N-Nitroso-di-n-propylamine		U		4.70	20
Hexachloroethane		U		3.80	20
Naphthalene-d_8		IS 2	11.57		
Nitrobenzene		U		2.63	20
Isophorone		U		1.48	20
2-Nitrophenol		U		3.84	20
2,4-Dimethylphenol		U		3.24	20
bis(2-Chloroethoxy)methane		U		3.28	20
Benzoic acid	48.28	J	11.05		50
2,4-Dichlorophenol		U		2.76	20
1,2,4-Trichlorobenzene		U		2.24	20
Naphthalene	1.64	J	11.61		20
4-Chloroaniline		U		2.13	20
Hexachlorobutadiene		U		2.70	20
4-Chloro-3-methylphenol		U		3.38	20

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL527

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-BT

Client Project: COE HOT GAS PRG	**Date Received: 02/06/96**	**Response File: YL518**
TLI ID: 113-217-3A-E	**Date Extracted: 02/07/96**	
	Date Analyzed : 03/08/96	
	Dilution Factor: 2.00	

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
2-Methylnaphthalene		U		1.31	20
Acenaphthene-d_{10}		IS 3	15.15		
Hexachlorocyclopentadiene		U		2.35	20
2,4,6-Trichlorophenol		U		2.93	20
2,4,5-Trichlorophenol		U		2.83	20
2-Chloronaphthalene		U		1.17	20
2-Nitroaniline		U		4.33	50
Dimethylphthalate		U		0.96	20
2,6-Dinitrotoluene		U		4.14	20
2,4-Dinitrotoluene		U		2.70	20
Acenaphthylene		U		0.75	20
3-Nitroaniline		U		3.76	50
Acenaphthene		U		1.34	20
2,4-Dinitrophenol		U		8.55	50
4-Nitrophenol		U		4.06	50
Dibenzofuran		U		0.78	20
Diethylphthalate	1.29	J	16.12		20
4-Chlorophenyl-phenylether		U		1.86	20
Fluorene		U		1.02	20
4-Nitroaniline		U		3.68	50
Phenanthrene-d_{10}		IS 4	18.21		
4,6-Dinitro-2-methylphenol		U		4.56	50
N-Nitrosodiphenylamine		U		1.47	20
4-Bromophenyl-phenylether		U		2.11	20
Hexachlorobenzene		U		1.51	20
Pentachlorophenol		U		2.64	50

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL527

Method 8270A M23
Sample ID: COE-HG-AFTOUT-M23-BT

Client Project: COE HOT GAS PRG	**Date Received: 02/06/96**	**Response File: YL518**
TLI ID: 113-217-3A-E	**Date Extracted: 02/07/96**	
	Date Analyzed : 03/08/96	
	Dilution Factor: 2.00	

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
Phenanthrene		U		0.58	20
Anthracene		U		0.58	20
Di-n-butylphthalate	8.30	J	19.53		20
Fluoranthene		U		0.44	20
Chrysene-d_{12}		IS 5 High	23.67		
Pyrene		U		0.30	20
Butylbenzylphthalate		U		0.52	20
3,3'-Dichlorobenzidine		U		0.84	20
bis(2-Ethylhexyl)phthalate	4.49	J	23.83		20
Benzo(a)anthracene		U		0.31	20
Chrysene		U		0.34	20
Perylene-d_{12}		IS 6 High	27.28		
Di-n-octylphthalate		U		0.31	20
Benzo(b)fluoranthene		U		0.42	20
Benzo(k)fluoranthene		U		0.43	20
Benzo(a)pyrene		U		0.43	20
Indeno(1,2,3-cd)pyrene		U		0.44	20
Dibenz(a,h)anthracene		U		0.58	20
Benzo(g,h,i)perylene		U		0.51	20

Reviewed by ___m___ Date 03/20/96

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

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Phone: (919) 544-5729 • Fax: (919) 544-5491

ROY F. WESTON

Project Number:	36062A	Method 8270A	
Sample File:	YL527	Sample ID: COE-HG-AFTOUT-M23-BT	
Client Project:	COE HOT GAS PRG	Date Received:	02/06/96
TLI ID:	113-217-3A-E	Date Extracted:	02/07/96
		Date Analyzed:	03/08/96
	Dilution Factor:	2	

Tentatively Identified Compounds

Name	RT	Area	IS RT	IS Area	Amount, ug
Benzaldehyde	8.358	1.2E+08	9.096	1981678	4835
Methyl Ester Benzoic Acid	10.269	1494525	9.096	1981678	60
Substituted Benzene	11.043	49167191	11.569	2239192	1757
Substituted Benzaldehyde	11.249	283057	11.569	2239192	10
Alkyl Methyl Ester Benzoic Acid	12.909	336455	11.569	2239192	12
Triacetin	13.299	9229154	11.569	2239192	330
Aromatic Ketone	13.412	307243	15.148	2626618	9
Bibenzyl	15.553	1827178	15.148	2626618	56
Benzophenone	16.665	359349	15.148	2626618	11
Alkyl Acid	19.501	938725	18.210	3588580	21
Substituted Aromatic Hydrocarbon	24.120	1885040	23.671	6236833	24
Substituted Aromatic Hydrocarbon	25.865	4053193	27.280	4280372	76

ROY F. WESTON

Project Number: 36062A
Sample File: YL523

Method 8270A TOLUENE
Sample ID: SBLK 020896

Client Project: COE HOT GAS PRG
TLI ID: SBLK020896

Date Received: / /
Date Extracted: / /
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
1,4-Dichlorobenzene-d_4		IS 1	9.10		
Phenol		U		2.87	20
bis(2-Chloroethyl)ether		U		3.42	20
2-Chlorophenol		U		2.06	20
1,3-Dichlorobenzene		U		1.75	20
1,4-Dichlorobenzene		U		1.67	20
1,2-Dichlorobenzene		U		1.79	20
2,2'-oxybis(1-Chloropropane)		U		3.52	20
Benzyl alcohol		U		6.51	20
2-Methylphenol		U		3.28	20
3/4-Methylphenol		U		3.23	20
N-Nitroso-di-n-propylamine		U		4.33	20
Hexachloroethane		U		3.50	20
Naphthalene-d_8		IS 2	11.57		
Nitrobenzene		U		2.26	20
Isophorone		U		1.27	20
2-Nitrophenol		U		3.30	20
2,4-Dimethylphenol		U		2.78	20
bis(2-Chloroethoxy)methane		U		2.82	20
Benzoic acid		U		3.72	50
2,4-Dichlorophenol		U		2.37	20
1,2,4-Trichlorobenzene		U		1.93	20
Naphthalene		U		0.76	20
4-Chloroaniline		U		1.83	20
Hexachlorobutadiene		U		2.32	20
4-Chloro-3-methylphenol		U		2.90	20

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL523

Method 8270A TOLUENE
Sample ID: SBLK 020896

Client Project: COE HOT GAS PRG
TLI ID: SBLK020896
Date Received: / /
Date Extracted: / /
Date Analyzed : 03/08/96
Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
2-Methylnaphthalene		U		1.13	20
Acenaphthene-d_{10}		IS 3	15.16		
Hexachlorocyclopentadiene		U		2.12	20
2,4,6-Trichlorophenol		U		2.65	20
2,4,5-Trichlorophenol		U		2.55	20
2-Chloronaphthalene		U		1.06	20
2-Nitroaniline		U		3.91	50
Dimethylphthalate		U		0.87	20
2,6-Dinitrotoluene		U		3.74	20
2,4-Dinitrotoluene		U		2.44	20
Acenaphthylene		U		0.68	20
3-Nitroaniline		U		3.40	50
Acenaphthene		U		1.21	20
2,4-Dinitrophenol		U		7.72	50
4-Nitrophenol		U		3.67	50
Dibenzofuran		U		0.71	20
Diethylphthalate		U		0.67	20
4-Chlorophenyl-phenylether		U		1.68	20
Fluorene		U		0.92	20
4-Nitroaniline		U		3.33	50
Phenanthrene-d_{10}		IS 4	18.22		
4,6-Dinitro-2-methylphenol		U		4.77	50
N-Nitrosodiphenylamine		U		1.53	20
4-Bromophenyl-phenylether		U		2.21	20
Hexachlorobenzene		U		1.58	20
Pentachlorophenol		U		2.76	50

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

ROY F. WESTON

Project Number: 36062A
Sample File: YL523

Method 8270A TOLUENE
Sample ID: SBLK 020896

Client Project: COE HOT GAS PRG
TLI ID: SBLK020896

Date Received: / /
Date Extracted: / /
Date Analyzed : 03/08/96

Response File: YL518

Dilution Factor: 2.00

Analyte	Amount ug	FLAG	RT	Det. Limit ug	Quan. Limit ug
Phenanthrene		U		0.60	20
Anthracene		U		0.61	20
Di-n-butylphthalate		U		0.35	20
Fluoranthene		U		0.46	20
Chrysene-d_{12}		IS 5 High	23.67		
Pyrene		U		0.32	20
Butylbenzylphthalate		U		0.57	20
3,3'-Dichlorobenzidine		U		0.92	20
bis(2-Ethylhexyl)phthalate		U		0.42	20
Benzo(a)anthracene		U		0.34	20
Chrysene		U		0.37	20
Perylene-d_{12}		IS 6 High	27.30		
Di-n-octylphthalate		U		0.24	20
Benzo(b)fluoranthene		U		0.33	20
Benzo(k)fluoranthene		U		0.34	20
Benzo(a)pyrene		U		0.34	20
Indeno(1,2,3-cd)pyrene		U		0.35	20
Dibenz(a,h)anthracene		U		0.46	20
Benzo(g,h,i)perylene		U		0.40	20

Reviewed by M Date 03/20/96

NA- Not Applicable; Det. Limit: Detection Limit; Quan. Limit: Quantitation Limit
IS: Internal Standard; U: Undetected; B: Present In Blank; J: Estimated- Below Quantitation Limit; E: Estimated- Above Calibration Range

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ROY F. WESTON	
Project Number: 36062A	Method 8270A
Sample File: YL523	Sample ID SBLK 020896

Client Project:	COE HOT GAS PRG	Date Received:	/ /
TLI ID:	SBLK 020896	Date Extracted:	/ /
		Date Analyzed:	03/08/96
		Dilution Factor:	2

Tentatively Identified Compounds

Name	RT	Area	IS RT	IS Area	Amount, ug
Benzaldehyde	8.286	148680	9.100	2137444	6

Triangle Laboratories of RTP, Inc.
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Printed: 17:35 03/20/96

PARTICULATE, HYDROCHLORIC ACID, AND CHLORINE

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE LABORATORY
ANALYTICAL REPORT

**Client : ** COE-HOT GAS
RFW# : 9602L965

W.O. #: 02281-012-012-1200-00
Date Received: 02-07-96

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 acetone, 4 filter, 4 sodium hydroxide and 4 sulfuric acid samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The method blanks were within method criteria.

5. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.

6. The matrix spike recovery for Chloride (as Chloride by IC) was within the 75-125% control limits.

7. The replicate analyses were within the 20% RPD control limit.

8. Results for Hydrochloric Acid and Chlorine are reported as total milligrams Chloride per sample volumes received.

J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2.23.96
Date

njp\i02-965

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF AIR SAMPLES

	ASTM	EPA 600	SW846	OTHER
%Moisture	_ D2216-80			_ ILMO4.0 (e)
%Solids				_ ILMO4.0 (e)
Hydroboric Acid by IC			_ 9056	
Hydrochloric Acid by IC			_ 9056 ✓9057	
Hydrofluoric Acid by IC			_ 9056	
Nitric Acid by IC			_ 9056	
Phosphoric Acid by IC			_ 9056	
Sulfuric Acid by IC			_ 9056	
Chromium VI			_ 7196A	_3500D
Ammonia		_ 350.3		
Particulate-Residue				✓40-CFR, PT60, App.A, Meth.5 (f)
Particulate-Filter				✓40-CFR, PT60, App.A, Meth.5 (f)
Sulfur Dioxide				_ 40-CFR, PT60, App.A, Meth.6 (f)
Sulfuric Acid Mist				_ 40-CFR, PT60, App.A, Meth.8 (f)
Nitrogen Oxide				_ 40-CFR, PT60, App.A, Meth.7A (f)
Fluoride, Total				_ 40-CFR, PT60, App.A, Meth.13B (f)
Hydrogen Chloride				_ 40-CFR, PT60, App.A, Meth.26 (f)

Other: Chlorine (as Chloride) Method: 9057

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U - Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* - Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB - Method or preparation blank.
MS - Matrix Spike.
MSD - Matrix Spike Duplicate.
REP - Sample Replicate.
LC - Indicates a method LCS or Blank Spike.
NC - Not calculable, result below the detection limit.

A suffix of -R, -S or -T following these codes indicate a replicate, spike or spike duplicate analysis respectively.

ANALYTICAL METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020)

3. Test Methods for Evaluating Solid Waste (USEPA SW846).

a. Standard Methods for the Examination of Water and Wastewater 16 ed., (1983).

b. Standard Methods for the Examination of Water and Wastewater 17 ed., (1988).

c. Methods of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986).

d. Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 02/22/96

CLIENT: COE-HOT GAS

WORK ORDER: 02281-012-012-1200-00

WESTON BATCH #: 9602L965

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	AFTOUT-PART-R1-FHA	Particulate	3.0	MG	0.10	1.0
-002	AFTOUT-PARTR1FLT1826	Particulate	0.10 u	MG	0.10	1.0
-003	AFTOUT-HCL-R1-H2SO4	Hydrochloric Acid by IC	2.0	MG	0.80	10.0
-004	AFTOUT-CL2-R1-NAOH	Chloride by IC	0.12	MG	0.10	4.0
-005	AFTOUT-PART-SB-FILT	Particulate	0.40	MG	0.10	1.0
-006	AFTOUT-PART-SB-ACE	Particulate	0.40	MG	0.10	1.0
-007	AFTOUT-HCL-SB-H2SO4	Hydrochloric Acid by IC	0.02 u	MG	0.02	1.0
-008	AFTOUT-CL2-SB-NAOH	Chloride by IC	0.02 u	MG	0.02	1.0
-009	AFTOUT-PART-R2-FHA	Particulate	1.6	MG	0.10	1.0
-010	AFTOUT-PARTR2FLT1832	Particulate	0.10 u	MG	0.10	1.0

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 02/22/96

WESTON BATCH #: 9602L965

CLIENT: COE-HOT GAS
WORK ORDER: 02281-012-012-1200-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	AFTOUT-HCL-R2-H2SO4	Hydrochloric Acid by IC	1.7	MG	0.67	10.0
-012	AFTOUT-CL2-R2-NAOH	Chloride by IC	0.60	MG	0.30	10.0
-013	AFTOUT-PART-R3-FHA	Particulate	4.1	MG	0.10	1.0
-014	AFTOUT-PARTR3FLT1825	Particulate	0.10 u	MG	0.10	1.0
-015	AFTOUT-HCL-R3-H2SO4	Hydrochloric Acid by IC	0.06 u	MG	0.06	1.0
-016	AFTOUT-CL2-R3-NAOH	Chloride by IC	0.62	MG	0.31	10.0

ROY F. WESTON INC.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/22/96

WESTON BATCH #: 9602L965

CLIENT: COE-HOT GAS
WORK ORDER: 02281-012-012-1200-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	96LHCL13-MB1	Hydrochloric Acid by IC	0.01 u	MG	0.01	1.0
BLANK10	96LCL213-MB1	Chloride by IC	0.01 u	MG	0.01	1.0

ROY F. WESTON INC.

INORGANICS ACCURACY REPORT 02/22/96

CLIENT: COE-HOT GAS

WEFSTON BATCH #: 9602L965

WORK ORDER: 02281-012-012-1200-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-016	AFTOUT-CL2-R3-NAOH	Chloride by IC	6.3	0.62	6.2	91.5	10.0
BLANK10	96LHCL13-MB1	Hydrochloric Acid by I	0.20	0.01u	0.20	99.5	1.0
		Hydrochloric Acid by I	0.19	0.01u	0.20	96.0	1.0
BLANK10	96LCL213-MB1	Chloride by IC	0.20	0.01u	0.20	99.5	1.0
		Chloride by IC MSD	0.19	0.01u	0.20	96.0	1.0

ROY F. WESTON INC.

INORGANICS DUPLICATE SPIKE REPORT 02/22/96

CLIENT: COE-HOT GAS

WESTON BATCH #: 9602L965

WORK ORDER: 02281-012-012-1200-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	96LHCL13-MB1	Hydrochloric Acid by IC	99.5	96.0	3.6
BLANK10	96LCL213-MB1	Chloride by IC	99.5	96.0	3.6

ROY F. WESTON INC.

INORGANICS PRECISION REPORT 02/22/96

CLIENT: COE-HOT GAS

WESTON BATCH #: 9602L965

WORK ORDER: 02281-012-012-1200-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-003REP	AFTOUT-HCL-R1-H2SO4	Hydrochloric Acid by IC	2.0	2.0	0.41	10.0
-004REP	AFTOUT-CL2-R1-NAOH	Chloride by IC	0.12	0.11	14.6	4.0
-007REP	AFTOUT-HCL-SB-H2SO4	Hydrochloric Acid by IC	0.02u	0.02u	NC	1.0
-008REP	AFTOUT-CL2-SB-NAOH	Chloride by IC	0.02u	0.02u	NC	1.0
-011REP	AFTOUT-HCL-R2-H2SO4	Hydrochloric Acid by IC	1.7	1.7	0.65	10.0
-012REP	AFTOUT-CL2-R2-NAOH	Chloride by IC	0.60	0.61	0.82	10.0
-015REP	AFTOUT-HCL-R3-H2SO4	Hydrochloric Acid by IC	0.06u	0.06u	NC	1.0
-016REP	AFTOUT-CL2-R3-NAOH	Chloride by IC	0.62	0.62	0.64	10.0

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96 RFW LOT # :9602L965

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-PART-R1-FHA						
PARTICULATE-FILTER	001	AI	96LPT005	01/31/96	02/12/96	02/17/96
AFTOUT-PARTR1FLT1826						
PARTICULATE-FILTER	002	AI	96LPT005	01/31/96	02/12/96	02/17/96
AFTOUT-HCL-R1-H2SO4						
HYDROCHLORIC ACID BY	003	AI	96LHCL13	01/31/96	02/19/96	02/19/96
HYDROCHLORIC ACID BY	003 REP	AI	96LHCL13	01/31/96	02/19/96	02/19/96
AFTOUT-CL2-R1-NAOH						
CHLORIDE BY IC	004	AI	96LCL213	01/31/96	02/19/96	02/19/96
CHLORIDE BY IC	004 REP	AI	96LCL213	01/31/96	02/19/96	02/19/96
AFTOUT-PART-SB-FILT						
PARTICULATE-FILTER	005	AI	96LPT005	01/31/96	02/12/96	02/17/96
AFTOUT-PART-SB-ACE						
PARTICULATE-FILTER	006	AI	96LPT005	01/31/96	02/12/96	02/17/96
AFTOUT-HCL-SB-H2SO4						
HYDROCHLORIC ACID BY	007	AI	96LHCL13	01/31/96	02/19/96	02/19/96
HYDROCHLORIC ACID BY	007 REP	AI	96LHCL13	01/31/96	02/19/96	02/19/96
AFTOUT-CL2-SB-NAOH						
CHLORIDE BY IC	008	AI	96LCL213	01/31/96	02/19/96	02/19/96
CHLORIDE BY IC	008 REP	AI	96LCL213	01/31/96	02/19/96	02/19/96
AFTOUT-PART-R2-FHA						
PARTICULATE-FILTER	009	AI	96LPT005	02/02/96	02/12/96	02/17/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L965

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-PARTR2FLT1832						
PARTICULATE-FILTER	010	AI	96LPT005	02/02/96	02/12/96	02/17/96
AFTOUT-HCL-R2-H2SO4						
HYDROCHLORIC ACID BY	011	AI	96LHCL13	02/02/96	02/19/96	02/19/96
HYDROCHLORIC ACID BY	011 REP	AI	96LHCL13	02/02/96	02/19/96	02/19/96
AFTOUT-CL2-R2-NAOH						
CHLORIDE BY IC	012	AI	96LCL213	02/02/96	02/19/96	02/19/96
CHLORIDE BY IC	012 REP	AI	96LCL213	02/02/96	02/19/96	02/19/96
AFTOUT-PART-R3-FHA						
PARTICULATE-FILTER	013	AI	96LPT005	02/04/96	02/12/96	02/17/96
AFTOUT-PARTR3FLT1825						
PARTICULATE-FILTER	014	AI	96LPT005	02/04/96	02/12/96	02/17/96
AFTOUT-HCL-R3-H2SO4						
HYDROCHLORIC ACID BY	015	AI	96LHCL13	02/04/96	02/19/96	02/19/96
HYDROCHLORIC ACID BY	015 REP	AI	96LHCL13	02/04/96	02/19/96	02/19/96
AFTOUT-CL2-R3-NAOH						
CHLORIDE BY IC	016	AI	96LCL213	02/04/96	02/19/96	02/19/96
CHLORIDE BY IC	016 REP	AI	96LCL213	02/04/96	02/19/96	02/19/96
CHLORIDE BY IC	016 MS	AI	96LCL213	02/04/96	02/19/96	02/19/96

LAB QC:

HYDROCHLORIC ACID BY	MB1	W	96LHCL13	N/A	02/19/96	02/19/96
HYDROCHLORIC ACID BY	MB1 BS	W	96LHCL13	N/A	02/19/96	02/19/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L965

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
HYDROCHLORIC ACID BY	MB1 BSD	W	96LHCL13	N/A	02/19/96	02/19/96
CHLORIDE BY IC	MB1	W	96LCL213	N/A	02/19/96	02/19/96
CHLORIDE BY IC	MB1 BS	W	96LCL213	N/A	02/19/96	02/19/96
CHLORIDE BY IC	MB1 BSD	W	96LCL213	N/A	02/19/96	02/19/96

PART/HCL/CL2

WESTON Analytics Use Only: 96021965

Custody Transfer Record/Lab Work Request

WESTON — Page 1 of 1

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Client: COE - HOT GAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill X7201
AD Project Manager: K. Baker
QC: S DD
Date Rec'd: 2/7/96 Date Due: 2/28/96
Account #: COEHOTGAS

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS / MSD	Matrix	Date Collected	Time Collected	EMAS Particulate	HCL 9057 IC	CL2 9057 IC
001	COE-HG-AFTOUT-PART-R1-FILT		Air	1/31/96		X		
2	COE-HG-AFTOUT-PART-R1-FILT		↓	↓		X (1824)	END	
3	COE-HG-AFTOUT-HCL-R1-H2SO4		Air	1/31/96			X	
4	COE-HG-AFTOUT-CL2-R1-NaOH		↓	↓				X
5	COE-HG-AFTOUT-PART-SB-FILT		Air	1/31/96		X (1833)		
6	COE-HG-AFTOUT-PART-SB-ACE			↓		X (1833) 2/7/96		
7	COE-HG-AFTOUT-HCL-SB-H2SO4						X	
8	COE-HG-AFTOUT-CL2-SB-NaOH		↓	↓				X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. Report HCL and
2. Cl2 as total
3. Cl based on
4. total sample volume
5. of each sample
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S D Charley	Richardson	2/7/96	1535				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered X
Airbill #
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

Part / HCL / Cl_2

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WESTON Analytics Use Only
9602L965

Custody Transfer Record/Lab Work Request

WESTON

Page 2 of 2

Client: COE - HOT GAS
Est. Final Proj. Sampling Date
Work Order #: 02281-012-012-120D
Project Contact/Phone #: J. O'Neill x7201
AD Project Manager: K. BAKER
QC: STD Del: STD TAT
Date Rec'd: Date Due
Account #

Refrigerator #												
#/Type Container	Liquid											
	Solid											
Volume	Liquid											
	Solid											
Preservatives												
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb		INORG: Metal	CN	HCL			Cl_2

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

WESTON Analytics Use Only: EPA 5 / Particulate; HCL 9057 IC; Cl_2 9057 IC

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb (EPA 5 Particulate)	HCL	Cl_2
009	COE-HG-AFTOUT-PART-R2-FHA hr				2/2/96					X		
10	COE-HG-AFTOUT-PART-R2-FILT				↓					X (1832)		
11	COE-HG-AFTOUT-HCL-R2-H_2SO_4				↓						X	
12	COE-HG-AFTOUT-Cl_2-R2-NaOH				↓							X
13	COE-HG-AFTOUT-PART-R3-FHA hr				2/4/96					X		
14	COE-HG-AFTOUT-PART-R3-FILT				↓					X (1825)		
15	COE-HG-AFTOUT-HCL-R3-H_2SO_4				↓						X	
16	COE-HG-AFTOUT-Cl_2-R3-NaOH				↓							X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S. O'Neill	Buchanan	2/7/96	1535				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

WESTON®

Particulate Sample Analyses

Prep Batch: 96LPT005
Worksheet: PRT0212

	96022965	Beaker #	Volume mL	Tare (1) grams	Tare (2) grams	Tare Ave.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Wt. milligrams
-001	FHA	965-1	118	109.9491	109.9488	109.9490	109.9519	109.9521	109.9520	0.0030	3.0
-002	Filter # 1826	—	—	0.3883	0.3882	0.3882	0.3856	0.3860	0.3858	-0.0024	-2.4
	Filter #										
	FH TOTAL			"							/
	BHW										
	BHA										

Comments Filter ripped in several small pieces

		Beaker #	Volume mL	Tare (1) grams	Tare (2) grams	Tare Ave.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Wt. milligrams
-009	FHA	965-9	110	123.8712	123.8708	123.8710	123.8725	123.8727	123.8726	0.0016	1.6
-010 ~~-005~~	Filter # 1832	—	—	0.3826	0.3827	0.3826	0.3799	0.3804	0.3802	-0.0024	-2.4
	Filter #										
	FH TOTAL										
	BHW										
	BHA										

Comments Filter ripped several small pieces

		Beaker #	Volume mL	Tare (1) grams	Tare (2) grams	Tare Ave.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Wt. milligrams
-013	FHA	965-13	198	113.3232	113.3230	113.3231	113.3271	113.3272	113.3272	0.0041	4.1
-014	Filter # 1825	—	—	0.3902	0.3904	0.3903	0.3872	0.3876	0.3874	-0.0029	-2.9
	Filter #										
	FH TOTAL										
	BHW										
	BHA										

Comments Filter ripped - several small pieces

-006	Acetone BLK	965-6	250	114.0237	114.0239	114.0238	114.0241	114.0242	114.0242	0.0004	0.4
-005 *	Filter BLK 1831		—	~~0.3868~~ 0.3803	~~0.3868~~ 0.3804	0.3804	0.3807	0.3810	0.3808	0.0004	0.4

CODE: FHA = Front half acetone BHW = Back half water (impinter contents + water wash) BHA - Back half acetone was FH TOTAL = Front half catch weight TOTAL = Total train catch weight

Analyst J. Medina Date 2/17/96 Reviewed by [signature] Date 2-18-96 Page # 038
Logbook #: 5029
Balance #: B-31
Balance Cal. 100g = 99.9994 g@ 18 °C

RFW 21-21-004/Z 08 95

* Filter number on filter is 1831. Filter number on chain is 1833. Reported Tare Value for # 1831.

Date of Prep: 02/12/96
Date of Analysis: 02/17/96
Worksheet: [illegible]0212
Computer #: [illegible]
Directory: INORGANICS

Run Batch: 96LFT005
Method: EPA [illegible]
Analyst: JDW
Instrument: BALANCE B-31

CALIB DATA
SLOPE: 0.00
INTERCEPT: 0.00
CORRELATION COEFF.: 0

RFW SAMPLE ID	TEST	TARE WEIGHT	FINAL WEIGHT	WEIGHT GRAMS	G TO MG	FINAL RESULT	DETECTION LIMIT 0.10	UNITS	REPLICATE: ORIG SAMPLE RESULT	REPLICATE: REP % DIFF	SPIKE: SPIKE LEVEL	SPIKE: SAMPLE SPIKE AMOUNT	SPIKE: % RECOV	LCS: AMT LCS ?	LCS: % RECOV	SOILS PREP: PREP BATCH	SOILS PREP: INITIAL SAMPLE WT.	SOILS PREP: FINAL VOL.	SOILS PREP: % SOLIDS	SOILS PREP: ANAL TIME	SOILS PREP: DATE PREP
9602L965-001	IPRTF	109.9490	109.9520	0.0030	1000	3.0	0.1	MG								96LPT005					
9602L965-002	IPRTF	0.3882	0.3858	-0.0024	1000	-2.4 u	0.1	MG								96LPT005					
9602L965-009	IPRTF	123.8710	123.8726	0.0016	1000	1.6	0.1	MG								96LPT005					
9602L965-010	IPRTF	0.3826	0.3802	-0.0024	1000	-2.4 u	0.1	MG								96LPT005					
9602L965-013	IPRTF	113.3231	113.3272	0.0041	1000	4.1	0.1	MG								96LPT005					
9602L965-014	IPRTF	0.3903	0.3874	-0.0029	1000	-2.9 u	0.1	MG								96LPT005					
9602L965-006	IPRTF	114.0238	114.0242	0.0004	1000	0.4	0.1	MG								96LPT005					
9602L965-005	IPRTF	0.3804	0.3808	0.0004	1000	0.4	0.1	MG								96LPT005					

WESTON®

IC PREPARATION LOG

Logbook # 5305

Test: IC Anions
Method # 21-15L-0300.0 Rev 02
Analysis Logbook # 5306

Prep Date: 2-19-96
Instrument: Dionex-2020i
Prep Batch: 96LIC013

Analyst: M. Carney
Start Time: 0946
End Time: 1626

RFW #	Prep. Wt/Vol.	Dilution	Spike Amount	QC	Comments Sample Vol rec.
9602L965-004	10mL	10,4,1	NA.	STD CLP	250
004R		10,4,1			250
012		10,			300
012R		10			300
016		10			310
016R		10			310
016S		10	2gL→10mL		310
003		10	NA.		800
003R		10			800
011		10			670
011R		10			670
015		1			620
015R		1			620
007		1			250
007R		1			250
008		1			200
008R		1			200

MC 2-19-96

Standard:	ID	Prep Date	Expir Date
MS	5305-102-03	1-22-96	2-22-96

Reviewed By/Date: Ligong 02/21/96

RFW 21-21-018/R-01/96

Page # 014

WESTON®

IC ANALYSIS SUMMARY: INORGANIC ANIONS

OP#: 21-15L-0300.0 Rev. 02
Analyst: M. Carney
Run Date: 2-19-96

Instrument: Dionex-2020I
Prep. Logbook #: 5305

Logbook: 5306
Prep Batch: 96LIC013
Worksheet: IC0219

Anion→	CL		HCL as Mg/Cl⁻		Cl2 as Mg/Cl		Detection Limit		TOTAL SAMPLE Vol.						Comments
Sample ID# ↓	mg/L mg/kg	Dil.	mg mg/L mg/kg	Dil.	mg mg/L mg/kg	Dil.	mg mg/L mg/kg	Dil.	mL mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	% Sol	Prep. wt/vol	
BLANK	0.086	-	0.009	-	0.009	-	0.010	mg	100	-					
ICV	1.985	-	0.199	-	0.199	-	0.010		100	-					
ICV Dup.	1.916		0.192	-	0.192	-	0.010		100	-					HCL + Cl2
9602L965-004	0.499	4	4.990		~~4.990~~ 9.685	4	0.100		250	-					Reported as
004R	0.431	4			~~4.310~~ 9.308	4	0.100		250	-					total mg
012	2.018	10			0.605	10	0.300		300	-					of Cl⁻
012R	2.032	10			0.60	10	0.300		300	-					Based on
016	1.997	10			0.619	10	0.310		310	-					total Sample
016R	2.009	10			0.623	10	0.310		310	-					Vol. REC'D
016S	20.288	10			6.292	10	0.310		310	-	Spike Amount = 6.20 mg				MC 2-21-96
003	2.456	10	1.965	10			0.800		800	-					
003R	2.446	10	1.957	10			0.800		800	-					
011	2.530	10	1.695	10			0.670		670	-					

MC 2-20-96
MC 2-20-96
NA

"R" = replicate, "S" = matrix spike, "T" = matrix spike duplicate

Standard	ID	Prep Date	Expir Date
ICV ICVDUP LCS	5305-104-33	2-19-96	2-20-96
ICAL CCV	13	⊥	⊥
MS	5305-104-03	1-22-96	2-22-96

Example Calculation:

Y = ax + b
Y = instrument reading
a = slope of the regression line
b = Y-intercept
x = concentration
result = X x dilution factor

Reviewed By/Date: Lizeng 02/21/96

Page #

RI W 21 211-0211 12 95

018

WESTON®

IC ANALYSIS SUMMARY: INORGANIC ANIONS

OP#: 21-15L-0300 0 Rev. 02
Analyst: M. Carney
RW Date: 2-19-96

Instrument: Dionex-2020I
Prep. Logbook #: 5305

Logbook: 5306
Prep Batch: 96LIC013
Worksheet: IC0219

Anion→	CL		HCL As Mg/cc		CL2 As Mg/cc		Detection Limit		TOTAL SAMPLE VOL						Comments
Sample ID# ↓	mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	mg/L mg/kg	Dil.	% Sol	Prep. wt/vol	
-011R	2.513	10	1.684	10			0.670	mg	670	ML					
015	0	-	0	-			0.060		620						
015R	0	-	0	-			0.060		620						
007	0.098	-	0.024	-			0.025		250						
007R	0	-	0	-			0.025		250						
008	0	-			0	-	0.020		200						
008R	0	-			0	-	0.020		200						
CCB	0	-	0	-	0	-	0.010		100						
CCV	1.922	-	0.192	-	0.192	-	0.010		100						

MC 2-20-96
MC 2-21-96
MC 2-21-96
MC 2-21-96

"R" = replicate, "S" = matrix spike, "T" = matrix spike duplicate

Standard:	ID	Prep Date	Expir Date
ICV ICV/DUP LCS	5305-104-33	2-19-96	2-20-96
CAL CCV	-13	↓	↓
MS	5305-104-03	1-22-96	2-22-96

Example Calculation:
Y = ax + b
Y = instrument reading
a = slope of the regression line
b = Y intercept
x = concentration
result = X x dilution factor

Reviewed By/Date:
Lizzy G 02/21/96

Page #

RFW 21 21I 021U 12 95

019

WESTON Analytics Inorganics Section

Date of Prep: 02/19/96
Date of Analysis: 02/19/96
Worksheet: IC0219
Computer #: AT 256
Directory: INORGANICS

Run Batch: 96LIC013
Method: EPA-300
Analyst: MC
Instrument: DIONEX

CALIB DATA
SLOPE: 1.00
INTERCEPT: 0.00
CORRELATION COEFF.: 1

RFW SAMPLE ID	TEST	INST. ABS	INITIAL RESULT	DILUTION FACTOR	C/D	FINAL RESULT	DETECTION LIMIT 0.25	UNITS	REPLICATE ORIG SAMPLE RESULT	REPLICATE REP % DIFF	SPIKE LEVEL 5.00	SPIKE SAMPLE SPIKE AMOUNT	SPIKE % RECOV	LCS AMT LCS ?	LCS % RECOV	SOILS PREP PREP BATCH	SOILS PREP INITIAL SAMPLE WT.	SOILS PREP INITIAL SAMPLE VOL REC'D	% SOLIDS	ANA TIM
LHCL13-MB1	ICHCL	0.009	0.009	1	1.0000	0.009 u	0.010	MG								96LHCL13		100		
LHCL13-MB1	ICHCLS	0.199	0.199	1	1.0000	0.199	0.010	MG	0.009		0.2	0.200	95.0			96LHCL13		100		
LHCL13-MB1	ICHCLT	0.192	0.192	1	1.0000	0.192	0.010	MG	0.009	3.8	0.2	0.200	91.5			96LHCL13		100		
602L965-003	ICHCL	1.965	1.965	10	1.0000	1.965	0.800	MG								96LHCL13		800		
602L965-003	ICHCLR	1.957	1.957	10	1.0000	1.957	0.800	MG	1.965	0.4						96LHCL13		800		
602L965-011	ICHCL	1.695	1.695	10	1.0000	1.695	0.670	MG								96LHCL13		670		
602L965-011	ICHCLR	1.684	1.684	10	1.0000	1.684	0.670	MG	1.695	0.7						96LHCL13		670		
602L965-015	ICHCL	0.000	0.000	1	1.0000	0.000 u	0.060	MG								96LHCL13		620		
602L965-015	ICHCLR	0.000	0.000	1	1.0000	0.000 u	0.060	MG	0.000	0.0						96LHCL13		620		
602L965-007	ICHCL	0.024	0.024	1	1.0000	0.024 u	0.025	MG								96LHCL13		250		
602L965-007	ICHCLR	0.000	0.000	1	1.0000	0.000 u	0.025	MG	0.024	200.0						96LHCL13		250		
CB	ICHCL	0.000	0.000	1	1.0000	0.000 u	0.010	MG								96LHCL13		100		
CV	ICHCLS	0.192	0.192	1	1.0000	0.192	0.010	MG	0.000		0.2	0.200	96.0			96LHCL13		100		
6LCL213-MB1	ICCL	0.009	0.009	1	1.0000	0.009 u	0.010	MG								96LCL213		100		
6LCL213-MB1	ICCL-S	0.199	0.199	1	1.0000	0.199	0.010	MG	0.009		0.2	0.200	95.0			96LCL213		100		
6LCL213-MB1	ICCL-T	0.192	0.192	1	1.0000	0.192	0.010	MG	0.009	3.8	0.2	0.200	91.5			96LCL213		100		
602L965-004	ICCL	0.125	0.125	4	1.0000	0.125	0.100	MG								96LCL213		250		
602L965-004	ICCL-R	0.108	0.108	4	1.0000	0.108	0.100	MG	0.125	14.6						96LCL213		250		
602L965-012	ICCL	0.605	0.605	10	1.0000	0.605	0.300	MG								96LCL213		330		
602L965-012	ICCL-R	0.610	0.610	10	1.0000	0.610	0.300	MG	0.605	0.8						96LCL213		300		
602L965-016	ICCL	0.619	0.619	10	1.0000	0.619	0.310	MG								96LCL213		310		
602L965-016	ICCL-R	0.623	0.623	10	1.0000	0.623	0.310	MG	0.619	0.6						96LCL213		310		
602L965-016	ICCL-S	6.292	6.292	10	1.0000	6.292	0.310	MG	0.619		6.2	6.200	91.5			96LCL213		310		
602L965-008	ICCL	0.000	0.000	1	1.0000	0.000 u	0.020	MG								96LCL213		200		
602L965-008	ICCL-R	0.000	0.000	1	1.0000	0.000 u	0.020	MG	0.000	0.0						96LCL213		200		
CB	ICCL	0.000	0.000	1	1.0000	0.000 u	0.010	MG								96LCL213		100		
CV	ICCL-S	0.192	0.192	1	1.0000	0.192	0.010	MG	0.000		0.2	0.200	96.0			96LCL213		100		

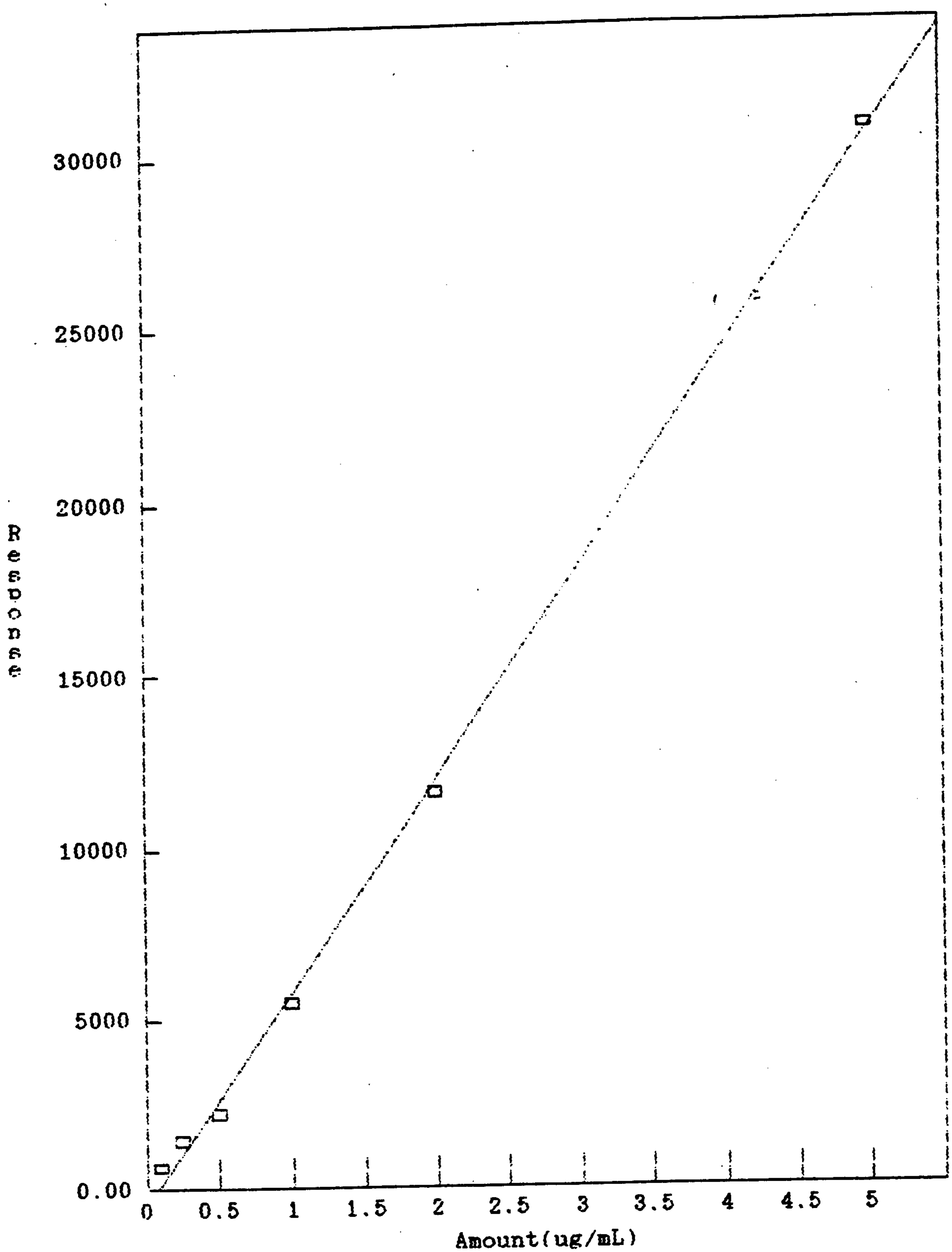
20

DIONEX SCHEDULE - C:\DX\SCHEDULE\021996.SCH

#	Sample Name	Method	Data File	Vol.	Dil.	Int.Std.
1	BLANK 02/19/96 09:46	..\AS4A9057	..\RAWDATA1	1	1	1
2	AUTOCAL1	..\AS4A9057	..\RAWDATA1	1	1	1
3	AUTOCAL2	..\AS4A9057	..\RAWDATA1	1	1	1
4	AUTOCAL3	..\AS4A9057	..\RAWDATA1	1	1	1
5	AUTOCAL4	..\AS4A9057	..\RAWDATA1	1	1	1
6	AUTOCAL5	..\AS4A9057	..\RAWDATA1	1	1	1
7	AUTOCAL6	..\AS4A9057	..\RAWDATA1	1	1	1
8	10 PPM	..\AS4A9057	..\RAWDATA1	1	1	1
9	96LIC013-ICV	..\AS4A9057	..\RAWDATA1	1	1	1
10	96LIC013-ICB	..\AS4A9057	..\RAWDATA1	1	1	1
11	96LIC013-ICV 2	..\AS4A9057	..\RAWDATA1	1	1	1
12	9602L965-004	..\AS4A9057	..\RAWDATA1	1	1	1
13	9602L965-004R	..\AS4A9057	..\RAWDATA1	1	1	1
14	9602L965-012	..\AS4A9057	..\RAWDATA1	1	10	1
15	9602L965-012R	..\AS4A9057	..\RAWDATA1	1	10	1
16	9602L965-016	..\AS4A9057	..\RAWDATA1	1	10	1
17	9602L965-016R	..\AS4A9057	..\RAWDATA1	1	10	1
18	9602L965-016S	..\AS4A9057	..\RAWDATA1	1	10	1
19	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
20	CCV	..\AS4A9057	..\RAWDATA1	1	1	1
21	CCB	..\AS4A9057	..\RAWDATA1	1	1	1
22	9602L965-003	..\AS4A9057	..\RAWDATA1	1	10	1
23	9602L965-003R	..\AS4A9057	..\RAWDATA1	1	10	1
24	9602L965-011	..\AS4A9057	..\RAWDATA1	1	10	1
25	9602L965-011R	..\AS4A9057	..\RAWDATA1	1	10	1
26	9602L965-015	..\AS4A9057	..\RAWDATA1	1	1	1
27	9602L965-015R	..\AS4A9057	..\RAWDATA1	1	1	1
28	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
29	CCV	..\AS4A9057	..\RAWDATA1	1	1	1
30	CCB	..\AS4A9057	..\RAWDATA1	1	1	1
31	9602L965-007	..\AS4A9057	..\RAWDATA1	1	1	1
32	9602L965-007R	..\AS4A9057	..\RAWDATA1	1	1	1
33	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
34	9602L965-008	..\AS4A9057	..\RAWDATA1	1	1	1
35	9602L965-008R	..\AS4A9057	..\RAWDATA1	1	1	1
36	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
37	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
38	9602L965-004	..\AS4A9057	..\RAWDATA1	1	10	1
39	9602L965-004R	..\AS4A9057	..\RAWDATA1	1	10	1
40	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
41	CCV	..\AS4A9057	..\RAWDATA1	1	1	1
42	CCB	..\AS4A9057	..\RAWDATA1	1	1	1
43	9602L965-004	..\AS4A9057	..\RAWDATA1	1	4	1
44	9602L965-004R	..\AS4A9057	..\RAWDATA1	1	4	1
45	BLANK	..\AS4A9057	..\RAWDATA1	1	1	1
46	CCV	..\AS4A9057	..\RAWDATA1	1	1	1
47	CCB 02/19/96 16:26	..\AS4A9057	..\RAWDATA1	1	1	1
48	HALT	..\HALT.met	..\RAWDATA1	1	1	1

Method: AS4A9057.MET -Method updated: 10:57 on 18 Dec 98

Component: CHLORIDE
Fit Type: Linear
r^2: 0.998722
Amt = Resp * 0.0001617 + 0.06977
Resp = Amt * 6185 + -431.5
Standardization: External
Calibration: Height



METALS

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96 RFW LOT # :9602L964

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-MMTL-R1-KMN4						
MERCURY, TOTAL	004	AI	96C0095	01/31/96	02/19/96	02/19/96
AFTOUT-MMTL-R1-HCL						
MERCURY, TOTAL	005	AI	96C0095	01/31/96	02/19/96	02/19/96
MERCURY, TOTAL	005 REP	AI	96C0095	01/31/96	02/19/96	02/19/96
MERCURY, TOTAL	005 MS	AI	96C0095	01/31/96	02/19/96	02/19/96
MERCURY, TOTAL	005 MSD	AI	96C0095	01/31/96	02/19/96	02/19/96
AFTOUT-MMTL-SB-HNO3						
SILVER, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
ARSENIC, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
BARIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
BERYLLIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
CADMIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
CHROMIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
MERCURY, TOTAL	008	AI	96C0095	01/31/96	02/19/96	02/19/96
NICKEL, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
LEAD, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
ANTIMONY, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
SELENIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
THALLIUM, TOTAL	008	AI	96L0322	01/31/96	02/17/96	02/19/96
AFTOUT-MMTL-SB-KMNO4						
MERCURY, TOTAL	009	AI	96C0095	01/31/96	02/19/96	02/19/96
AFTOUT-MMTL-SB-BHHCL						
MERCURY, TOTAL	010	AI	96C0095	01/31/96	02/19/96	02/19/96
AFTOUT-METLS-R2BHHN3						
SILVER, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L964

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
BARIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
BERYLLIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
CADMIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
CHROMIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
MERCURY, TOTAL	013	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	013 REP	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	013 MS	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	013 MSD	AI	96C0095	02/02/96	02/19/96	02/19/96
NICKEL, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
LEAD, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
ANTIMONY, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
SELENIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
THALLIUM, TOTAL	013	AI	96L0322	02/02/96	02/17/96	02/19/96
AFTOUT-METLS-R2-KMN4						
MERCURY, TOTAL	014	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	014 REP	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	014 MS	AI	96C0095	02/02/96	02/19/96	02/19/96
MERCURY, TOTAL	014 MSD	AI	96C0095	02/02/96	02/19/96	02/19/96
AFTOUT-METLS-R2-HCL						
MERCURY, TOTAL	015	AI	96C0095	02/02/96	02/19/96	02/19/96
AFTOUT-METLS-R3BHHN3						
SILVER, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
ARSENIC, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
BARIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
BERYLLIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
CADMIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
CHROMIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
MERCURY, TOTAL	018	AI	96C0095	02/04/96	02/19/96	02/19/96
NICKEL, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
LEAD, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
ANTIMONY, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L964

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
THALLIUM, TOTAL	018	AI	96L0322	02/04/96	02/17/96	02/19/96
AFTOUT-METLS-R3-KMN4						
MERCURY, TOTAL	019	AI	96C0095	02/04/96	02/19/96	02/19/96
AFTOUT-METLS-R3-HCL						
MERCURY, TOTAL	020	AI	96C0095	02/04/96	02/19/96	02/19/96
OUT-METLS-PTRA-HNO3						
SILVER, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
ARSENIC, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
BARIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
BERYLLIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
CADMIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
CHROMIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
ERCURY, TOTAL	021	AI	96C0095	01/30/96	02/19/96	02/19/96
ICKEL, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
LEAD, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
ANTIMONY, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
SELENIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
THALLIUM, TOTAL	021	AI	96L0322	01/30/96	02/17/96	02/19/96
COMP R1						
SILVER, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
ARSENIC, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
BARIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
BERYLLIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
CADMIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
CHROMIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
MERCURY, TOTAL	023	AI	96C0095	01/31/96	02/19/96	02/19/96
NICKEL, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
LEAD, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
ANTIMONY, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L964.

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
THALLIUM, TOTAL	023	AI	96L0322	01/31/96	02/17/96	02/20/96
COMP-SB						
SILVER, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
ARSENIC, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
BARIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
BERYLLIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
CADMIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
CHROMIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
MERCURY, TOTAL	024	AI	96C0095	01/31/96	02/19/96	02/19/96
NICKEL, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
LEAD, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
ANTIMONY, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
SELENIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
THALLIUM, TOTAL	024	AI	96L0322	01/31/96	02/17/96	02/20/96
COMP R2						
SILVER, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
ARSENIC, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
BARIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
BERYLLIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
CADMIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
CHROMIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
MERCURY, TOTAL	025	AI	96C0095	02/02/96	02/19/96	02/19/96
NICKEL, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
LEAD, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
ANTIMONY, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
SELENIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
THALLIUM, TOTAL	025	AI	96L0322	02/02/96	02/17/96	02/19/96
COMP R3						
SILVER, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
ARSENIC, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
BARIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

RFW LOT # :9602L964

DATE RECEIVED: 02/07/96

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BERYLLIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
CADMIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
CHROMIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
MERCURY, TOTAL	026	AI	96C0095	02/04/96	02/19/96	02/19/96
NICKEL, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
LEAD, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
ANTIMONY, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
SELENIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96
THALLIUM, TOTAL	026	AI	96L0322	02/04/96	02/17/96	02/19/96

LAB QC:

MERCURY LABORATORY	LC1 BS	W	96C0095	N/A	02/19/96	02/19/96
MERCURY LABORATORY	LC2 BS	W	96C0095	N/A	02/19/96	02/19/96
MERCURY, TOTAL	MB1	W	96C0095	N/A	02/19/96	02/19/96
SILVER LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
SILVER LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
SILVER, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
ARSENIC LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
ARSENIC LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
ARSENIC, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
BARIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
BARIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
BARIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
BERYLLIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
BERYLLIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
BERYLLIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
CADMIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
CADMIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
CADMIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
CHROMIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
CHROMIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
CHROMIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
NICKEL LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
NICKEL LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
NICKEL, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
LEAD LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
LEAD LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96

RFW LOT # :9602L964

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
LEAD, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
ANTIMONY LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
ANTIMONY LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
ANTIMONY, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
SELENIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
SELENIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
SELENIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96
THALLIUM LABORATORY	LC1 BS	AI	96L0322	N/A	02/17/96	02/19/96
THALLIUM LABORATORY	LC2 BS	AI	96L0322	N/A	02/17/96	02/19/96
THALLIUM, TOTAL	MB1	AI	96L0322	N/A	02/17/96	02/19/96

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WESTON MANAGERS DESIGNERS/CONSULTANTS

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skl\tc2-964

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WESTON

Chain of Custody

WESTON Analytics Use Only: 9602L964

Metals

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 3

Client: COE - HOT GAS
Est. Final Proj. Sampling Date
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill x 7201
AD Project Manager: K. Baker 9421
QC: SW
Date Rec'd: 2/7/96
Date Due: 2/21/96 2/25/96
Account #: COEHOTGAS

Refrigerator #

#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →

ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

All samples

WESTON Analytics Use Only

EPA Method 29

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS / MSD	Matrix	Date Collected	Time Collected	Sb	As	Ba	Be	Cd	Cr	Pb	Ni	Se	Ag	Tl	Mcomp	Hg	
001	COE-H6-AFTOUT-MMTL-R1-FHNO3		Air	1/31/96		X	X	X	X	X	X	X	X	X	X	X	✓	X	Run
2	COE-H6-AFTOUT-MMTL-R1-FLT					X	X	X	X	X	X	X	X	X	X	X	✓	X	One
3	COE-H6-AFTOUT-MMTL-R1-BHHNO3/H2O2					X	X	X	X	X	X	X	X	X	X	X		X	
4	COE-H6-AFTOUT-MMTL-R1-KMnO4																	X	
5	COE-H6-AFTOUT-MMTL-R1-HCl/H2O																	X	
6	COE-H6-AFTOUT-MMTL-SB-HNO3			1/31/96		X	X	X	X	X	X	X	X	X	X	X	✓	X	Site Bla[nk]
7	COE-H6-AFTOUT-MMTL-SB-FLT					X	X	X	X	X	X	X	X	X	X	X	✓	X	
8	COE-H6-AFTOUT-MMTL-SB-HNO3/H2O2					X	X	X	X	X	X	X	X	X	X	X		X	
9	COE-H6-AFTOUT-MMTL-SB-KMnO4																	X	
10	COE-H6-AFTOUT-MMTL-SB-BAHCl																	X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
MMTL - METALS
SB - Site Blanks

DATE/REVISIONS:
1. R1 BHHNO3 Recd broken
2. MMSC in field
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S.D. [illegible]	[illegible]	2/7/96	1540				

WESTON Analytics Use Only

Samples were:
1) Shipped or Hand Delivered X
Airbill #
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only
9602L964

Metals
Custody Transfer Record/Lab Work Request

WESTON

Client CDE HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # J. O'Neill X720
AD Project Manager K. Baker
QC SD Del SD TAT
Date Rec'd ______ Date Due
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →
ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

WESTON Analytics Use Only — EPA Method 29

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Sb	As	Ba	Be	Cd	Cr	Pb	Ni	Se	Ag	Tl	mcomp	Hg
01	CDE-H6-AFT01-METAL-R2-FHHNO3			Air	2/2/96		X	X	X	X	X	X	X	X	X	X	X	✓	X
12	CDE-H6-AFT01-METAL-R2-FILT						X	X	X	X	X	X	X	X	X	X	X	✓	X
13	CDE-H6-AFT01-METAL-R2-0.1HNO3/H2O2						X	X	X	X	X	X	X	X	X	X	X		X
14	CDE-H6-AFT01-METAL-R2-KMnO4																		X
15	CDE-H6-AFT01-METAL-R2-HCl																		X
16	CDE-H6-AFT01-METAL-R3-FHHNO3				2/4/96		X	X	X	X	X	X	X	X	X	X	X	✓	X
17	CDE-H6-AFT01-METAL-R3-FILT						X	X	X	X	X	X	X	X	X	X	X	✓	X
18	CDE-H6-AFT01-METAL-R3-HNO3/H2O2						X	X	X	X	X	X	X	X	X	X	X		X
19	CDE-H6-AFT01-METAL-R3-KMnO4																		X
20	CDE-H6-AFT01-METAL-R3-HCl																		X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. ID for R3 FHHNO3 reads
2. R1 FH HNO3 - Determined
3. Identify by date collected
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S. DiCarlo	Richards	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

FW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381 596a

WESTON Analytics Use Only
9602L964

Metals

Custody Transfer Record/Lab Work Request

WESTON

Page 2 of 3

Client COE - HOT GBS
Est. Final Proj. Sampling Date
Work Order # 02281-012-02-1200
Project Contact/Phone # J. O'Neill x7201
AD Project Manager K. Baker
QC SID Del 2DD TAT
Date Due
Date Rec'd
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

WESTON Analytics Use Only — EPA Method 24

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	Sb	As	Ba	Be	Cd	Cr	Pb	Ni	Se	Ag	TL	Hg	MMSC
21	COE-HG-OUT-METALS-PTRA-HW				1/23/96		X	X	X	X	X	X	X	X	X	X	X	X	✓
22	COE-HG-OUT-METALS-PTRB-HW				↓														
23	Comp R1				1/31/96		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
24	Comp SB																		
25	Comp R2				2/2/96														
26	Comp R3				2/4/96														

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
PTR = Predrain Rinse

DATE/REVISIONS:
1.
2. HOLD PTRB
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped or Hand Delivered
Airbill #
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S.D. Carl	[illegible]	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381 596a

014

Case Narrative

Sample Custody Transfer Record

Page 1 of 1

RFW BATCH #: 96021964
CLIENT: COS Hotgal

LF = Locked Refrigerator

SAMPLE SIGN-OUT: / SAMPLE RETURN:

Item/Reason (e.g., "all VOA water," "001-004, Extraction")	Total # /Matrix (e.g., 4 W)	Relinquished By	Received By	Date	Time	Total # /Matrix (e.g., 4 W)	Relinquished By	Received By	Date	Time	Comments (e.g., "volume depleted," "kept #002")
1,2,4→21 metals	20 A	LF #	[illegible]	2-15-96	16:00	16A	Metals	Koerber	2/19	1030	
1-2, 4, 10, 13-15, 18-21, 23-26	16A	Metals	Koerber	2/19	1030	16A	Koerber	LF	2/19	1320	

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW# : 9602L964

W.O. #: 02281-012-012-1200
Date Received: 02-07-96

SW846 METALS

1. This narrative covers the analyses of 16 air samples.

2. The samples were prepared with Multi Metals method 29 digestion, analyzed in accordance with SW-846 protocol and reported with CLP deliverable.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All Initial and Continuing Calibration Verifications (ICV/CCV's) were within control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

7. All Preparation/Method Blanks were within method criteria.

8. All ICP Interference Check Standards were within control limits.

9. All Laboratory Control Samples (LCS) were within the laboratory derived control limits.

10. All Mercury matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the 80-120% control limits. All MSD's were within the 20% Relative Percent Difference (RPD) control limits.

11. The duplicate of sample R1H for Mercury analysis was outside the 20% Relative Percent Difference (RPD) control limits.

12. The code AV currently in use by the laboratory is for the mercury instruments (HG1 & HG2). HG1 & HG2 are complete with autosampler and software, but still require manual digestion.

WESTON MANAGERS DESIGNERS/CONSULTANTS

13. HG1 & HG2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).

14. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the Cover Page of the CLP Forms to correlate the modified sample IDs to the RFW#s or refer below to correlate modified IDs to original client IDs:

Original ID#s	Modified ID#s
COE-HG-AFTOUT-MMTL-R1-KMNO4	R1K
COE-HG-AFTOUT-MMTL-R1-HCL/H2O	R1H
COE-HG-AFTOUT-MMTL-SB-HNO3/H2O	SBH
COE-HG-AFTOUT-MMTL-SB-KMNO4	SBK
COE-HG-AFTOUT-MMTL-SB-BHHCL	SBB
COE-HG-AFTOUT-METALS-R2-BHHNO3/H2O	R2B
COE-HG-AFTOUT-METALS-R2-KMNO4	R2K
COE-HG-AFTOUT-METALS-R2-HCL	R2H
COE-HG-AFTOUT-METALS-R3-BHHNO3/HCL	R3B
COE-HG-AFTOUT-METALS-R3-KMNO4	R3K
COE-HG-AFTOUT-METALS-HCL	R3H
COE-HG-AFTOUT-PTRA-HNO3	PTRA
COMP R1	COMP R1
COMP SB	COMP SB
COMP R2	COMP R2
COMP R3	COMP R3

[signature]
J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2.26.96
Date

skl\m02-964

METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this RFW Lot#: 9602L964

Leaching Procedure: __1310 __1311 __1312 __Other: ____________

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3020A __3050A __200.7 __SS17
✓ Other: Multi-Metals Method 29

Metals Analysis Methods

	SW846		EPA		EPA OSWR	USATHAMA
Aluminum	__6010		__200.7			__99
Antimony	✓6010	__7041	__200.7	__204.2		__99
Arsenic	✓6010	__7060A	__200.7	__206.2		__99
Barium	✓6010		__200.7			__99
Beryllium	✓6010		__200.7			__99
Bismuth	__6010 1		__200.7 1		__1620 1	__99
Boron	__6010		__200.7			__99
Cadmium	✓6010	__7131A	__200.7	__213.2		__99
Calcium	__6010		__200.7			__99
Chromium	✓6010	__7191	__200.7	__218.2		__SS17
Cobalt	__6010		__200.7			__99
Copper	__6010	__7211	__200.7	__220.2		__99
Iron	__6010		__200.7			__99
Lead	✓6010	__7421	__200.7	__239.2		__99
Lithium	__6010 1	__7430 3	__200.7 1		__1620 1	__99
Magnesium	__6010		__200.7			__99
Manganese	__6010		__200.7			__99
Mercury	✓7470 2	__7471 2	__245.1 2	__245.5 2		__99
Molybdenum	__6010		__200.7			__99
Nickel	✓6010		__200.7			__99
Potassium	__6010	__7610 3	__200.7	__258.1 3		__99
Rare Earths	__6010 1		__200.7 1		__1620 1	__99
Selenium	✓6010	__7740	__200.7	__270.2		__99
Silicon	__6010		__200.7		__1620 1	__99
Silica	__6010 1		__200.7		__1620 1	__99
Silver	✓6010	__7761	__200.7	__272.2		__99
Sodium	__6010	__7770 3	__200.7	__273.1 3		__99
Strontium	__6010		__200.7			__99
Thallium	✓6010	__7841	__200.7	__279.2		__99
Tin	__6010		__200.7			__99
Titanium	__6010		__200.7			__99
Uranium	__6010 1		__200.7 1		__1620 1	__99
Vanadium	__6010		__200.7			__99
Zinc	__6010		__200.7			__99
Zirconium	__6010 1		__200.7 1		__1620 1	__99

Other:____________ Method:____________

pas/5-95/method.met

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U - Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* - Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB - Method or preparation blank.
MS - Matrix Spike.
MSD - Matrix Spike Duplicate.
REP - Sample Replicate.
LCS - Indicates a Laboratory Control Sample.
NC - Not calculated.

ANALYTICAL METAL METHODS

1. Modified
2. Modified Hg: Hg1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for Mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA

WESTON.

Inorganic Analysis Data Package

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.:COMPR1

SOW No.: SW846

EPA Sample No.	Lab Sample ID
COMPR1	9602L964-023
COMPR2	9602L964-025
COMPR3	9602L964-026
COMPSB	9602L964-024
PTRA	9602L964-021
R1H	9602L964-005
R1HD	9602L964-005D
R1HT	9602L964-005T
R1HS	9602L964-005S
R1K	9602L964-004
R2B	9602L964-013
R2BD	9602L964-013D
R2BT	9602L964-013T
R2BS	9602L964-013S
R2H	9602L964-015
R2K	9602L964-014
R2KD	9602L964-014D
R2KT	9602L964-014T
R2KS	9602L964-014S
R3B	9602L964-018

ere ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: [signature] Name: Ray Siery

Date: 2.26.96 Title: Section Manager

COVER PAGE - IN

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ROY_F._WESTON_INC._______ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.:COMPR1

SOW No.: SW846

EPA Sample No.	Lab Sample ID
R3H	9602L964-020
R3K	9602L964-019
SBB	9602L964-010
SBH	9602L964-008
SBK	9602L964-009

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: [signature] Name: RAY SIENY

Date: 2/26/96 Title: SECTION MANAGER

COVER PAGE - IN

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

COMPR1

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12
Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-023
Level (low/med): LOW__ Date Received: 02/07/96
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	18.0			P
7440-38-2	Arsenic	4.4	U		P
7440-39-3	Barium	23.8			P
7440-41-7	Beryllium	0.020			P
7440-43-9	Cadmium	1.6			P
7440-47-3	Chromium	44.4			P
7439-92-1	Lead	25.1			P
7439-97-6	Mercury	0.02 ~~0.00010~~	U	*	AV
7440-02-0	Nickel	8.5			P
7782-49-2	Selenium	5.1	U		P
7440-22-4	Silver	1.3	U		P
7440-28-0	Thallium	4.5	U		P

ES 2.23.96

Color Before: ______ Clarity Before: ______ Texture: ______
Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

COMPR2

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12
Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-025
Level (low/med): LOW Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	14.8			P
7440-38-2	Arsenic	4.4	U		P
7440-39-3	Barium	3.0			P
7440-41-7	Beryllium	0.015	U		P
7440-43-9	Cadmium	0.79			P
7440-47-3	Chromium	45.2			P
7439-92-1	Lead	11.5			P
7439-97-6	Mercury	0.02 ~~0.00010~~	U	A	AV
7440-02-0	Nickel	8.6			P
7782-49-2	Selenium	5.1	U		P
7440-22-4	Silver	1.3	U		P
7440-28-0	Thallium	4.5	U		P

ES 2.23.96

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

COMPR3

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12
Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-026
Level (low/med): LOW Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	13.7			P
7440-38-2	Arsenic	4.4	U		P
7440-39-3	Barium	2.4			P
7440-41-7	Beryllium	0.015	U		P
7440-43-9	Cadmium	0.40	U		P
7440-47-3	Chromium	32.8			P
7439-92-1	Lead	10.3			P
7439-97-6	Mercury	0.02 ~~0.00010~~	U	~~N~~	AV
7440-02-0	Nickel	2.6			P
7782-49-2	Selenium	5.1	U		P
7440-22-4	Silver	1.3	U		P
7440-28-0	Thallium	4.5	U		P

ES 8-23-96

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

COMPSB

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12
Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-024
Level (low/med): LOW__ Date Received: 02/07/96
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	15.0			P
7440-38-2	Arsenic	4.4	U		P
7440-39-3	Barium	4.0			P
7440-41-7	Beryllium	0.015	U		P
7440-43-9	Cadmium	0.40	U		P
7440-47-3	Chromium	1.5			P
7439-92-1	Lead	7.8			P
7439-97-6	Mercury	0.02 ~~0.00010~~	U	~~*~~	AV
7440-02-0	Nickel	1.2	U		P
7782-49-2	Selenium	5.1	U		P
7440-22-4	Silver	1.3	U		P
7440-28-0	Thallium	4.5	U		P

ES 8.28.96

Color Before: ________ Clarity Before: ______ Texture: ______
Color After: ________ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PTRA

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12

SDG No.: COMPR1

Lab Code: WESTON Case No.: _____ SAS No.: _______

Lab Sample ID: 9602L964-021

Matrix (soil/water): WATER

Date Received: 02/07/96

Level (low/med): LOW__

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	5.4 ~~4.4~~	U	mlw 2/23/96	P_
7440-38-2	Arsenic__	3.7 ~~3.0~~	U		P_
7440-39-3	Barium___	0.57 ~~0.45~~			P_
7440-41-7	Beryllium	0.01 ~~0.010~~	U		P_
7440-43-9	Cadmium__	4.1 ~~4.9~~	_		P_
7440-47-3	Chromium_	2.1 ~~1.7~~	_		P_
7439-92-1	Lead_____	13.6 ~~10.9~~			P_
7439-97-6	Mercury__	0.25 ~~0.0010~~	U	*	AV
7440-02-0	Nickel___	2.3 ~~1.8~~			P_
7782-49-2	Selenium_	4.3 ~~3.4~~	U		P_
7440-22-4	Silver___	1.1 ~~0.86~~	U		P_
7440-28-0	Thallium_	3.8 ~~3.0~~	U		P_
		mlw 2/23/96			

ES 2.23.96

Color Before: __________ Clarity Before: ______ Texture: ______

Color After: __________ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

R1H

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12
Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-005
Level (low/med): LOW Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.05 ~~0.00017~~		~~?~~	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

ES 2.28.96

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

R1K

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12
Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-004
Level (low/med): LOW Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.09 ~~0.00036~~		~~B~~	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

R2B

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix (soil/water): WATER Lab Sample ID: 9602L964-013

Level (low/med): LOW__ Date Received: 02/07/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	4.5 ~~4.4~~	U	mlw 2/23/96	P
7440-38-2	Arsenic	3.3 ~~3.0~~	U		P
7440-39-3	Barium	0.29 ~~0.27~~			P
7440-41-7	Beryllium	0.01 ~~0.010~~	U		P
7440-43-9	Cadmium	0.36 ~~0.27~~	U		P
7440-47-3	Chromium	0.82 ~~0.74~~			P
7439-92-1	Lead	3.6 ~~3.3~~	U		P
7439-97-6	Mercury	0.54 ~~0.0010~~	U	*	AV
7440-02-0	Nickel	4.1 ~~3.7~~			P
7782-49-2	Selenium	3.8 ~~3.4~~	U		P
7440-22-4	Silver	0.93 ~~0.86~~	U		P
7440-28-0	Thallium	3.3 ~~3.0~~	U		P

mlw 2/23/96

ES 2.23.96

Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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EPA SAMPLE NO.

R2H

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12
Lab Code: WESTON Case No.: _____ SAS No.: _______ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-015
Level (low/med): LOW__ Date Received: 02/07/96
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.05 ~~0.00023~~		J	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: ______ Clarity Before: ______ Texture: ______
Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

R2K

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: _____ SDG No.: COMPR1

Matrix (soil/water): WATER Lab Sample ID: 9602L964-014

Level (low/med): LOW__ Date Received: 02/07/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.21 ~~0.00054~~			AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: ______ Clarity Before: ______ Texture: ______

Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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EPA SAMPLE NO.

R3B

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12
Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-018
Level (low/med): LOW__ Date Received: 02/07/96
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony_	4.8 ~~4.4~~	U		P_
7440-38-2	Arsenic__	3.2 ~~3.0~~	U		P_
7440-39-3	Barium___	0.22 ~~0.20~~	_		P_
7440-41-7	Beryllium	0.010	U		P_
7440-43-9	Cadmium__	0.30 ~~0.27~~	U		P_
7440-47-3	Chromium_	0.59 ~~0.54~~	_		P_
7439-92-1	Lead_____	3.6 ~~3.3~~	U		P_
7439-97-6	Mercury__	0.59 ~~0.0010~~	U	~~/~~	AV
7440-02-0	Nickel___	0.86 ~~0.79~~	U		P_
7782-49-2	Selenium_	3.7 ~~3.4~~	U		P_
7440-22-4	Silver___	0.97 ~~0.86~~	U		P_
7440-28-0	Thallium_	3.3 ~~3.0~~	U		P_

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Color Before: ________ Clarity Before: ________ Texture: ________
Color After: ________ Clarity After: ________ Artifacts: ________

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

R3H

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12

Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1

Matrix (soil/water): WATER Lab Sample ID: 9602L964-020

Level (low/med): LOW Date Received: 02/07/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.03 ~~0.00012~~		✗	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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EPA SAMPLE NO.

R3K

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12
Lab Code: WESTON Case No.: _____ SAS No.: _____ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-019
Level (low/med): LOW__ Date Received: 02/07/96
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.12 ~~0.00030~~	U	J	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: ______ Clarity Before: ______ Texture: ______
Color After: ______ Clarity After: ______ Artifacts: ______

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SBB

Lab Name: ROY_F._WESTON_INC.
Contract: 2281-12-12
Lab Code: WESTON
Case No.:
SAS No.:
SDG No.: COMPR1
Matrix (soil/water): WATER
Lab Sample ID: 9602L964-010
Level (low/med): LOW
Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.02 ~~0.00010~~	U	~~J~~	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before:
Clarity Before:
Texture:
Color After:
Clarity After:
Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SBH

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12

Lab Code: WESTON Case No.: ____ SAS No.: ____ SDG No.: COMPR1

Matrix (soil/water): WATER Lab Sample ID: 9602L964-008

Level (low/med): LOW Date Received: 02/07/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.8 ~~4.4~~	U		P
7440-38-2	Arsenic	3.4 ~~3.0~~	U		P
7440-39-3	Barium	0.27 ~~0.18~~	U		P
7440-41-7	Beryllium	0.010	U		P
7440-43-9	Cadmium	0.56 ~~0.27~~	U		P
7440-47-3	Chromium	0.12 ~~0.46~~	U		P
7439-92-1	Lead	4.4 ~~3.3~~	U		AV ES 2.23.96
7439-97-6	Mercury	0.2 ~~0.0010~~	U	*	AV
7440-02-0	Nickel	1.1 ~~0.79~~	U		P
7782-49-2	Selenium	4.6 ~~3.4~~	U		P
7440-22-4	Silver	1.1 ~~0.86~~	U		P
7440-28-0	Thallium	4.0 ~~3.0~~	U		P

Color Before: ____ Clarity Before: ____ Texture: ____

Color After: ____ Clarity After: ____ Artifacts: ____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

SBK

Lab Name: ROY_F._WESTON_INC.
Contract: 2281-12-12
Lab Code: WESTON Case No.: ____ SAS No.: ____ SDG No.: COMPR1
Matrix (soil/water): WATER Lab Sample ID: 9602L964-009
Level (low/med): LOW Date Received: 02/07/96
% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-47-3	Chromium				NR
7439-92-1	Lead				NR
7439-97-6	Mercury	0.07 ~~0.00030~~	U	~~A~~	AV
7440-02-0	Nickel				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-28-0	Thallium				NR

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Color Before: ____ Clarity Before: ____ Texture: ____
Color After: ____ Clarity After: ____ Artifacts: ____

Comments:

FORM I - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.: COMPR1

Initial Calibration Source: IV__________

Continuing Calibration Source: IV__________

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	%R(1)	Continuing Calibration Found	%R(1)	M
Antimony				3000.0	3190.92	106.4	3182.71	106.1	P
Arsenic				10000.0	10517.10	105.2	10478.21	104.8	P
Barium				5000.0	4957.50	99.2	4938.65	98.8	P
Beryllium				250.0	241.94	96.8	241.02	96.4	P
Cadmium				250.0	265.77	106.3	263.19	105.3	P
Chromium				500.0	505.98	101.2	503.77	100.8	P
Lead				2500.0	2573.82	103.0	2551.48	102.1	P
Mercury	5.0	5.05	101.0	5.0	5.07	101.4	5.01	100.2	AV
Nickel				2000.0	2030.12	101.5	2005.61	100.3	P
Selenium				10000.0	10498.98	105.0	10465.59	104.7	P
Silver				500.0	504.78	101.0	502.18	100.4	P
Thallium				10000.0	10435.16	104.4	10380.05	103.8	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: _______ SDG No.: COMPR1

Initial Calibration Source: IV___________

Continuing Calibration Source: IV___________

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Antimony				3000.0	3082.47	102.7			P
Arsenic				10000.0	10154.76	101.5			P
Barium				5000.0	5073.14	101.5			P
Beryllium				250.0	241.43	96.6			P
Cadmium				250.0	256.59	102.6			P
Chromium				500.0	504.57	100.9			P
Lead				2500.0	2538.40	101.5			P
Mercury				5.0	4.82	96.4	4.83	96.6	AV
Nickel				2000.0	2016.31	100.8			P
Selenium				10000.0	10104.37	101.0			P
Silver				500.0	499.60	99.9			P
Thallium				10000.0	9968.31	99.7			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

AA CRDL Standard Source: HIGH PURITY_

ICP CRDL Standard Source: HIGH PURITY_

Concentration Units: ug/L

Analyte	CRDL Standard for AA True	Found	%R	CRDL Standard for ICP True	Initial Found	%R	Final Found	%R
Antimony				120.0	113.36	94.5	0.00	0.0
Arsenic				400.0	380.33	95.1	0.00	0.0
Barium				200.0	191.73	95.9	0.00	0.0
Beryllium				10.0	9.24	92.4	0.00	0.0
Cadmium				10.0	11.32	113.2	0.00	0.0
Chromium				20.0	17.72	88.6	0.00	0.0
Lead				100.0	102.09	102.1	0.00	0.0
Mercury	0.2	0.23	115.0					
Nickel				80.0	74.62	93.3	0.00	0.0
Selenium				400.0	407.62	101.9	0.00	0.0
Silver				20.0	16.76	83.8	0.00	0.0
Thallium				400.0	401.01	100.3	0.00	0.0

FORM II (PART 2) - IN

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

AA CRDL Standard Source: HIGH PURITY_

ICP CRDL Standard Source: HIGH PURITY_

Concentration Units: ug/L

Analyte	CRDL Standard for AA True	CRDL Standard for AA Found	CRDL Standard for AA %R	CRDL Standard for ICP True	CRDL Standard for ICP Initial Found	CRDL Standard for ICP %R	CRDL Standard for ICP Final Found	CRDL Standard for ICP %R
Antimony				120.0	115.34	96.1	0.00	0.0
Arsenic				400.0	407.21	101.8	0.00	0.0
Barium				200.0	204.38	102.2	0.00	0.0
Beryllium				10.0	9.67	96.7	0.00	0.0
Cadmium				10.0	9.71	97.1	0.00	0.0
Chromium				20.0	19.76	98.8	0.00	0.0
Lead				100.0	89.55	89.6	0.00	0.0
Mercury								
Nickel				80.0	83.54	104.4	0.00	0.0
Selenium				400.0	397.74	99.4	0.00	0.0
Silver				20.0	20.90	104.5	0.00	0.0
Thallium				400.0	422.95	105.7	0.00	0.0

FORM II (PART 2) - IN

U.S. EPA - CLP

3
BLANKS

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.: COMPR1

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG___

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	43.5	U	43.5	U	43.5	U			43.500	U	P
Arsenic	29.6	U	29.6	U	29.6	U			29.600	U	P
Barium	1.8	U	1.8	U	1.8	U			1.800	U	P
Beryllium	0.1	U	0.1	U	0.1	U			0.100	U	P
Cadmium	2.7	U	2.7	U	2.7	U			2.700	U	P
Chromium	4.6	U	4.6	U	4.6	U			4.600	U	P
Lead	32.7	U	32.7	U	32.7	U			-35.024		P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.100	U	AV
Nickel	7.9	U	7.9	U	7.9	U			7.900	U	P
Selenium	34.3	U	34.3	U	34.3	U			34.300	U	P
Silver	8.6	U	8.6	U	8.6	U			8.600	U	P
Thallium	30.1	U	30.1	U	30.1	U			30.100	U	P

FORM III - IN

U.S. EPA - CLP

3
BLANKS

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: _______ SDG No.: COMPR1

Preparation Blank Matrix (soil/water): ______

Preparation Blank Concentration Units (ug/L or mg/kg): ______

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Antimony	43.5	U	43.5	U							P
Arsenic	29.6	U	29.6	U							P
Barium	1.8	U	1.8	U							P
Beryllium	0.1	U	0.1	U							P
Cadmium	2.7	U	2.7	U							P
Chromium	4.6	U	4.6	U							P
Lead	32.7	U	32.7	U							P
Mercury			0.1	U							AV
Nickel	7.9	U	-8.0								P
Selenium	-42.2		34.3	U							P
Silver	8.6	U	8.6	U							P
Thallium	30.1	U	30.1	U							P

FORM III - IN

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ROY_F._WESTON_INC._______ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No: ______ SDG No.: COMPR1

ICP ID Number: IC3_________ ICS Source: IV__________

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Antimony		1000		1048.4	104.8		1038.0	103.8
Arsenic		1000		974.9	97.5		939.3	93.9
Barium		500		478.9	95.8		489.8	98.0
Beryllium		500		461.3	92.3		469.1	93.8
Cadmium		1000		997.9	99.8		1005.6	100.6
Chromium		500		464.7	92.9		470.8	94.2
Lead		1000		968.7	96.9		947.4	94.7
Mercury								
Nickel		1000		902.8	90.3		916.3	91.6
Selenium		1000		910.6	91.1		899.4	89.9
Silver		1000		1048.4	104.8		1065.9	106.6
Thallium		1000		1017.3	101.7		983.1	98.3

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R1HS

Lab Name: ROY_F._WESTON_INC.________ Contract:2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	80-120	0.36 ~~0.0011~~		0.05 ~~0.0002~~		0.32 ~~0.00~~	96.~~0~~ 9		AV
Nickel									NR
Selenium									NR
Silver									NR
Thallium									NR

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R1HT

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead									AV
Mercury	80-120	0.36 ~~0.0011~~		0.05 ~~0.0002~~		0.32 ~~0.00~~	96.9 ~~97.0~~		NR
Nickel									NR
Selenium									NR
Silver									NR
Thallium									

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R2BS

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead							90.7		NR
Mercury	80-120	4.9 ~~0.0091~~		0.54 ~~0.0010~~	U	5.4 ~~0.01~~	~~91.0~~		AV
Nickel									NR
Selenium									NR
Silver									NR
Thallium									NR

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R2BT

Lab Name: ROY_F._WESTON_INC.________ Contract:2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	80-120	4.7 ~~0.0087~~		0.54 ~~0.0010~~	U	0.01	87.0		AV
Nickel									NR
Selenium									NR
Silver									NR
Thallium									NR

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R2KS

Lab Name: ROY_F._WESTON_INC.________ Contract:2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	80-120	1.3 ~~0.0033~~		0.21 ~~0.0005~~		1.2 ~~0.003~~	90.8 ~~93.3~~		AV
Nickel									NR
Selenium									NR
Silver									NR
Thallium									NR

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

R2KT

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: _____ SDG No.: COMPR1

Matrix: __WATER__________ Level (low/med): _LOW____

% Solids for Sample: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Chromium									NR
Lead									NR
Mercury	80-120	1.3 ~~0.0032~~		0.21 ~~0.0005~~		1.2 ~~0.003~~	90.8 ~~90.0~~		AV ES 2/28 -
Nickel									NR
Selenium									NR
Silver									NR
Thallium									NR

Comments:

FORM V (Part 1) - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

R1HD

Lab Name: ROY_F._WESTON_INC._______ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.: COMPR1

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Chromium								NR
Lead		0.05 ~~0.0002~~		0.04 ~~0.0001~~		22.2 ~~20.4~~ ~~19.4~~	~~*~~	AV
Mercury								NR
Nickel								NR
Selenium								NR
Silver								NR
Thallium								NR

FORM VI - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

R2BD

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: _______ SDG No.: COMPR1

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Antimony_								NR
Arsenic_								NR
Barium_								NR
Beryllium								NR
Cadmium_								NR
Chromium_								NR
Lead_		0.54 ~~0.0010~~	U	0.54 ~~0.0010~~	U			AV
Mercury_								NR
Nickel_								NR
Selenium_								NR
Silver_								NR
Thallium_								

CJ 2.23.96

FORM VI - IN

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

R2KD

Lab Name: ROY_F._WESTON_INC._______ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: _______ SDG No.: COMPR1

Matrix (soil/water): WATER Level (low/med): _LOW__

% Solids for Sample: __0.0 % Solids for Duplicate: ___0.0

Concentration Units (ug/L or mg/kg dry weight): UG___

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Chromium								NR
Lead								NR
Mercury		0.21 ~~0.0005~~		0.19 ~~0.0005~~		10.0 ~~5.7~~		AV
Nickel								NR
Selenium								NR
Silver								NR
Thallium								NR

ES 2.23.94

FORM VI - IN

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12

Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1

Solid LCS Source:

Aqueous LCS Source: IV

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous (ug/L) %R	Solid (mg/kg) True	Solid (mg/kg) Found	C	Limits		%R
Antimony	3000.0	3046.39	101.5						
Arsenic	10000.0	9726.98	97.3						
Barium	5000.0	4986.73	99.7						
Beryllium	250.0	236.44	94.6						
Cadmium	250.0	248.87	99.5						
Chromium	500.0	495.94	99.2						
Lead	2500.0	2457.99	98.3						
Mercury									
Nickel	2000.0	1965.75	98.3						
Selenium	10000.0	9765.65	97.7						
Silver	500.0	492.87	98.6						
Thallium	10000.0	9711.85	97.1						

FORM VII - IN

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: _______ SDG No.: COMPR1

Solid LCS Source: ______________

Aqueous LCS Source: IV___________

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Antimony	3000.0	3101.33	103.4						
Arsenic	10000.0	9951.04	99.5						
Barium	5000.0	5065.14	101.3						
Beryllium	250.0	241.05	96.4						
Cadmium	250.0	251.29	100.5						
Chromium	500.0	503.50	100.7						
Lead	2500.0	2483.78	99.4						
Mercury									
Nickel	2000.0	2003.68	100.2						
Selenium	10000.0	9910.34	99.1						
Silver	500.0	501.44	100.3						
Thallium	10000.0	9943.76	99.4						

FORM VII - IN

U.S. EPA - CLP

7
LABORATORY CONTROL SAMPLE

Lab Name: ROY_F._WESTON_INC.

Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

Solid LCS Source: ______________

Aqueous LCS Source: IV

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Chromium									
Lead									
Mercury	5.0	4.87	97.4						
Nickel									
Selenium									
Silver									
Thallium									

FORM VII - IN

U.S. EPA - CLP

7
LABORATORY CONTROL SAMPLE

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.: COMPR1

Solid LCS Source: ____________

Aqueous LCS Source: IV__________

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous %R	Solid (mg/kg) True	Solid (mg/kg) Found	C	Limits		%R
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Chromium									
Lead									
Mercury	5.0	4.95	99.0						
Nickel									
Selenium									
Silver									
Thallium									

FORM VII - IN

U.S. EPA - CLP

8
STANDARD ADDITION RESULTS

Lab Name: ROY_F._WESTON_INC._______ Contract:2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.:______ SDG No.:COMPR1

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

FORM VIII - IN

U.S. EPA - CLP

10

Instrument Detection Limits (Quarterly)

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12

Lab Code: WESTON Case No.: SAS No.: SDG No.: COMPR1

ICP ID Number: IC3 Date: 01/01/96

Flame AA ID Number :

Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Antimony	206.80			43.5	P
Arsenic	193.60			29.6	P
Barium	493.40			1.8	P
Beryllium	313.00			0.1	P
Cadmium	228.80			2.7	P
Chromium	267.70			4.6	P
Lead	220.30			32.7	P
Mercury					NR
Nickel	231.60			7.9	P
Selenium	196.00			34.3	P
Silver	328.00			8.6	P
Thallium	276.80			30.1	P

Comments:

FORM X - IN

U.S. EPA - CLP

10
Instrument Detection Limits (Quarterly)

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12
Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1
ICP ID Number: ______ Date: 01/01/96
Flame AA ID Number : HG2________
Furnace AA ID Number : ______

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Antimony					NR
Arsenic					NR
Barium					NR
Beryllium					NR
Cadmium					NR
Chromium					NR
Lead					NR
Mercury	220.30			0.1	AV
Nickel					NR
Selenium					NR
Silver					NR
Thallium					NR

Comments:

FORM X - IN

U.S. EPA - CLP

11A
ICP Interelement Correction Factors (Annually)

Lab Name: ROY_F._WESTON_INC. Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.: COMPR1

ICP ID Number: IC3 Date: 07/01/95

Analyte	Wave-length (nm)	Interelement Correction Factors for :				
		Al	Ca	Fe	Mg	AS
Antimony	206.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0005200
Arsenic	193.60	0.0043760	0.0000000	0.0001600	0.0000000	0.0000000
Barium	493.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0145340
Chromium	267.70	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.30	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Mercury						
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.00	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.00	0.0000000	0.0000000	-0.0001600	0.0000000	0.0000000
Thallium	276.80	0.0000000	0.0000000	0.0082870	0.0000000	0.0000000

Comments:

FORM XI (Part 1) - IN

U.S. EPA - CLP

11B
ICP Interelement Correction Factors (Annually)

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: _____ SAS No.: ______ SDG No.: COMPR1

ICP ID Number: IC3__________ Date: 07/01/95

Analyte	Wave-length (nm)	Interelement Correction Factors for : NI_	V__	___	___	___
Antimony_	_206.80__	0.0000000	-0.0104600_			
Arsenic__	_193.60__	_0.0000000	_0.0189000_			
Barium___	_493.40__	_0.0000000	_0.0000000_			
Beryllium	_313.00__	_0.0000000	_0.0041940_			
Cadmium__	_228.80__	_0.0000000	_0.0000000_			
Chromium_	_267.70__	_0.0000000	_0.0000000_			
Lead_____	_220.30__	_0.0000000	_0.0000000_			
Mercury__						
Nickel___	_231.60__	_0.0000000	_0.0000000_			
Selenium_	_196.00__	_0.0000000	_0.0000000_			
Silver___	_328.00__	_0.0000000	_0.0000000_			
Thallium_	_276.80__	_0.0000000	_0.0012300_			

Comments:

FORM XI (Part 2) - IN

U.S. EPA - CLP

12

ICP Linear Ranges (Quarterly)

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: _______ SDG No.: COMPR1

ICP ID Number: IC3__________ Date: 01/01/96

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Antimony	3.30	120000.0	P
Arsenic	3.30	100000.0	P
Barium	3.30	100000.0	P
Beryllium	3.30	5000.0	P
Cadmium	3.30	25000.0	P
Chromium	3.30	50000.0	P
Lead	3.30	250000.0	P
Mercury			NR
Nickel	3.30	200000.0	P
Selenium	3.30	100000.0	P
Silver	3.30	10000.0	P
Thallium	3.30	100000.0	P

Comments:

FORM XII - IN

U.S. EPA - CLP

13

PREPARATION LOG

Lab Name: ROY_F._WESTON_INC._______ Contract: 2281-12-12

Lab Code: WESTON Case No.:______ SAS No.: ______ SDG No.:COMPR1

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
COMPR1	02/16/96		150
COMPR2	02/16/96		150
COMPR3	02/16/96		150
COMPSB	02/16/96		150
LCSW122	02/16/96		100
LCSW222	02/16/96		100
PBW122	02/16/96		100
PTRA	02/16/96		100
R2B	02/16/96		100
R3B	02/16/96		100
SBH	02/16/96		100

FORM XIII - IN

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.:______ SAS No.: ______ SDG No.:COMPR1

Method: AV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
COMPR1	02/19/96		33
COMPR2	02/19/96		33
COMPR3	02/19/96		33
COMPSB	02/19/96		33
LCSW195	02/19/96		33
LCSW295	02/19/96		33
PBW195	02/19/96		33
PTRA	02/19/96		33
R1H	02/19/96		33
R1HD	02/19/96		33
R1HS	02/19/96		33
R1HT	02/19/96		33
R1K	02/19/96		33
R2B	02/19/96		33
R2BD	02/19/96		33
R2BS	02/19/96		33
R2BT	02/19/96		33
R2H	02/19/96		33
R2K	02/19/96		33
R2KD	02/19/96		33
R2KS	02/19/96		33
R2KT	02/19/96		33
R3B	02/19/96		33
R3H	02/19/96		33
R3K	02/19/96		33
SBB	02/19/96		33
SBH	02/19/96		33
SBK	02/19/96		33

FORM XIII - IN

U.S. EPA - CLP

14
ANALYSIS RUN LOG

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.:COMPR1

Instrument ID Number: IC3__________ Method: P_

Start Date: 02/19/96 End Date: 02/19/96

EPA Sample No.	D/F	Time	% R	SB	AS	BA	BE	CD	CR	PB	HG	NI	SE	AG	TL
S0	1.00	1422		X	X	X	X	X	X	X	–	X	X	X	X
S1A	1.00	1424		X	–	X	X	X	X	X	–	X	–	X	–
S1B	1.00	1426		X	–	X	X	X	X	X	–	X	–	X	–
S1	1.00	1429		X	–	X	X	X	X	X	–	X	–	X	–
S2A	1.00	1431		–	X	–	–	–	–	–	–	–	X	–	X
S2B	1.00	1433		–	X	–	–	–	–	–	–	–	X	–	X
S2	1.00	1435		–	X	–	–	–	–	–	–	–	X	–	X
STD1	1.00	1439		X	X	X	X	X	X	X	–	X	X	X	X
STD2	1.00	1442		X	X	X	X	X	X	X	–	X	X	X	X
ICB	1.00	1448		X	X	X	X	X	X	X	–	X	X	X	X
ICSAB	1.00	1450		X	X	X	X	X	X	X	–	X	X	X	X
CRI	1.00	1455		X	X	X	X	X	X	X	–	X	X	X	X
PBW122	1.00	1501		X	X	X	X	X	X	X	–	X	X	X	X
LCSW122	1.00	1504		X	X	X	X	X	X	X	–	X	X	X	X
LCSW222	1.00	1506		X	X	X	X	X	X	X	–	X	X	X	X
SBH	1.00	1509		X	X	X	X	X	X	X	–	X	X	X	X
R2B	1.00	1513		X	X	X	X	X	X	X	–	X	X	X	X
R3B	1.00	1516		X	X	X	X	X	X	X	–	X	X	X	X
PTRA	1.00	1519		X	X	X	X	X	X	X	–	X	X	X	X
COMPR2	1.00	1522		X	X	X	X	X	X	X	–	X	X	X	X
CCV	1.00	1526		X	X	X	X	X	X	X	–	X	X	X	X
CCB	1.00	1530		X	X	X	X	X	X	X	–	X	X	X	X
COMPR3	1.00	1532		X	X	X	X	X	X	X	–	X	X	X	X
ICSAB	1.00	1535		X	X	X	X	X	X	X	–	X	X	X	X
CCV	1.00	1541		X	X	X	X	X	X	X	–	X	X	X	X
CCB	1.00	1544		X	X	X	X	X	X	X	–	X	X	X	X

FORM XIV - IN

U.S. EPA - CLP

14
ANALYSIS RUN LOG

Lab Name: ROY_F._WESTON_INC.______ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.:COMPR1

Instrument ID Number: IC3__________ Method: P_

Start Date: 02/20/96 End Date: 02/20/96

EPA Sample No.	D/F	Time	% R	SB	AS	BA	BE	CD	CR	PB	HG	NI	SE	AG	TL
S0	1.00	1851		X	X	X	X	X	X	X	_	X	X	X	X
S1A	1.00	1853		X	_	X	X	X	X	X	_	X	_	X	_
S1B	1.00	1855		X	_	X	X	X	X	X	_	X	_	X	_
S1	1.00	1858		X	_	X	X	X	X	X	_	X	_	X	_
S2A	1.00	1900		_	X	_	_	_	_	_	_	_	X	_	X
S2B	1.00	1902		_	X	_	_	_	_	_	_	_	X	_	X
S2	1.00	1904		_	X	_	_	_	_	_	_	_	X	_	X
STD1	1.00	1908		X	X	X	X	X	X	X	_	X	X	X	X
STD2	1.00	1911		X	X	X	X	X	X	X	_	X	X	X	X
ICB	1.00	1917		X	X	X	X	X	X	X	_	X	X	X	X
ICSAB	1.00	1919		_	_	_	_	_	_	_	_	_	_	_	_
CRI	1.00	1924		X	X	X	X	X	X	X	_	X	X	X	X
COMPR1	1.00	1930		X	X	X	X	X	X	X	_	X	X	X	X
COMPSB	1.00	1933		X	X	X	X	X	X	X	_	X	X	X	X
ICSAB	1.00	1944		X	X	X	X	X	X	X	_	X	X	X	X
CCV	1.00	1950		X	X	X	X	X	X	X	_	X	X	X	X
CCB	1.00	1953		X	X	X	X	X	X	X	_	X	X	X	X

FORM XIV - IN

U.S. EPA - CLP

14

ANALYSIS RUN LOG

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.:COMPR1

Instrument ID Number: HG2___________ Method: AV

Start Date: 02/19/96 End Date: 02/19/96

EPA Sample No.	D/F	Time	% R	Analytes											
				SB	AS	BA	BE	CD	CR	PB	HG	NI	SE	AG	TL
S0	1.00	1531									X				
S0.5	1.00	1534									X				
S1	1.00	1536									X				
S2	1.00	1539									X				
S5	1.00	1542									X				
S10	1.00	1545									X				
ICV	1.00	1548									X				
ICB	1.00	1551									X				
CCV	1.00	1554									X				
CCB	1.00	1556									X				
CRA	1.00	1559									X				
PBW195	1.00	1602									X				
LCSW195	1.00	1605									X				
LCSW295	1.00	1607									X				
R1K	3.00	1610									X				
R1H	1.00	1613									X				
R1HD	1.00	1616									X				
R1HS	1.00	1618									X				
R1HT	1.00	1621									X				
SBH	10.00	1624									X				
CCV	1.00	1627									X				
CCB	1.00	1630									X				
SBK	3.00	1632									X				
SBB	1.00	1635									X				
R2B	10.00	1638									X				
R2BD	10.00	1641									X				
R2BS	10.00	1643									X				
R2BT	10.00	1646									X				
R2K	3.00	1649									X				
R2KD	3.00	1652									X				
R2KS	3.00	1654									X				
R2KT	3.00	1657									X				

FORM XIV - IN

U.S. EPA - CLP

14
ANALYSIS RUN LOG

Lab Name: ROY_F._WESTON_INC.________ Contract: 2281-12-12

Lab Code: WESTON Case No.: ______ SAS No.: ______ SDG No.:COMPR1

Instrument ID Number: HG2__________ Method: AV

Start Date: 02/19/96 End Date: 02/19/96

EPA Sample No.	D/F	Time	% R	SB	AS	BA	BE	CD	CR	PB	HG	NI	SE	AG	TL
CCV	1.00	1700									X				
CCB	1.00	1703									X				
R2H	1.00	1705									X				
R3B	10.00	1708									X				
R3K	3.00	1711									X				
R3H	1.00	1714									X				
PTRA	10.00	1716									X				
COMPR1	1.00	1719									X				
COMPSB	1.00	1722									X				
COMPR2	1.00	1724									X				
COMPR3	1.00	1727									X				
CCV	1.00	1730									X				
CCB	1.00	1733									X				

FORM XIV - IN

Raw Data

Metals by ICP

Standardization Rpt. Mon 02-19-96 02:24:33 PM page 1

Method: COE Standard: S0

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Avge	.0200	.0513	.0300	.0047	.0947	.0027	.0173
SDev	.0144	.0372	.0275	.0050	.0042	.0061	.0145
%RSD	72.11	72.40 IEC	91.65	107.9	4.917	229.1	83.47
#1	.0240	.0340	.0540	.0040	.0380	-.0040	.0100
#2	.0040	.0260	.0000	.0000	.0860	.0040	.0340
#3	.0320	.0940	.0360	.0100	.0800	.0080	.0080

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Avge	.0167	.0407	.0240	.0260	-.0087	-.0087	-.0060
SDev	.0220	.0767	.0191	.0561	.0314	.0248	.0171
%RSD	132.2 IEC	188.7	79.49	215.8	362.2	286.7	284.8 IEC
#1	-.0060	.1000	.0020	.0800	-.0440	-.0240	-.0240
#2	.0380	.0680	.0360	.0300	.0020	.0200	-.0040
#3	.0180	-.0460	.0340	-.0320	.0160	-.0220	.0100

Elem	Zn2138
Avge	.0093
SDev	.0129
%RSD	137.8 NIR
#1	.0000
#2	.0040
#3	.0240

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Metreved ~~[illegible]~~ [illegible]96
+ updated AT [illegible]96

PS0219B IC3.2

96L0322-MB1
-LC1
-LC2
9602L964-008
-013
-018
-021
-025
-026

COE-HOT CCAS

SW846

No Return

Standardization Rpt. Mon 02-19-96 02:26:51 PM page 1

Method: COE Standard: S1A

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	.9207	3.291	23.93	15.41	.5167	2.503	37.33
SDev	.0162	.023	.15	.09	.0136	.016	.24
%RSD	1.756	.7123	.6203	.5933	2.635	.6408	.6319
#1	.9060	3.264	24.01	15.46	.5320	2.502	37.45
#2	.9180	3.300	24.03	15.47	.5120	2.520	37.48
#3	.9380	3.308	23.76	15.30	.5060	2.488	37.06

Elem	Ni2316	Pb2203	Sb2068	V-2924	Zn2138
Avge	14.99	2.850	10.26	10.79	5.062
SDev	.05	.042	.11	.04	.026
%RSD	.3202	1.474	1.117	.3552	.5167
#1	14.94	2.880	10.16	10.81	5.080
#2	14.99	2.802	10.23	10.81	5.074
#3	15.04	2.868	10.39	10.74	5.032

Method: COE Standard: S1B

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	1.809	6.599	48.91	31.34	1.069	5.056	75.29
SDev	.014	.058	.64	.27	.026	.052	.64
%RSD	.7842	.8755	1.313	.8474	2.441	1.031	.8493
#1	1.812	6.630	49.26	31.51	1.072	5.106	75.68
#2	1.794	6.532	48.16	31.03	1.042	5.002	74.55
#3	1.822	6.634	49.29	31.47	1.094	5.060	75.64

Elem	Ni2316	Pb2203	Sb2068	V-2924	Zn2138
Avge	30.07	5.753	20.76	21.91	10.25
SDev	.17	.050	.20	.20	.07
%RSD	.5521	.8728	.9403	.8940	.6882
#1	30.19	5.766	20.97	22.03	10.29
#2	29.88	5.698	20.59	21.68	10.17
#3	30.14	5.796	20.73	22.01	10.30

Standardization Rpt. Mon 02-19-96 02:31:27 PM page 1

Method: COE Standard: S1

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	3.585	13.17	97.26	62.32	2.091	9.903	148.0
SDev	.025	.1	.43	.29	.001	.057	.6
%RSD	.6931	.7350	.4432	.4646	.0552	.5774	.3785
#1	3.600	13.24	97.40	62.42	2.090	9.952	148.3
#2	3.598	13.22	97.60	62.54	2.092	9.916	148.4
#3	3.556	13.06	96.77	61.99	2.092	9.840	147.4

Elem	Ni2316	Pb2203	Sb2068	V-2924	Zn2138
Avge	59.02	11.26	41.13	43.36	20.27
SDev	.31	.12	.18	.18	.08
%RSD	.5258	1.051	.4481	.4132	.4133
#1	59.25	11.36	41.22	43.47	20.29
#2	59.14	11.30	41.25	43.45	20.34
#3	58.67	11.13	40.92	43.15	20.17

Standardization Rpt. Mon 02-19-96 02:33:30 PM page 1

Method: COE Standard: S2A

Elem	As1936	Se1960	Tl1908
Avge	13.43	14.49	18.19
SDev	.15	.21	.28
%RSD	1.092	1.474	1.554
#1	13.42	14.62	18.17
#2	13.29	14.24	17.92
#3	13.59	14.61	18.49

Method: COE Standard: S2P

Elem	As1936	Se1960	Tl1908
Avge	26.41	28.59	35.91
SDev	.15	.28	.35
%RSD	.5575	.9661	.9756
#1	26.32	28.42	36.31
#2	26.32	28.45	35.75
#3	26.58	28.91	35.67

Standardization Rpt. Mon 02-19-96 02:37:35 PM page 1

Method: COE Standard: S2

Elem	As1936	Se1960	Tl1908
Avge	53.09	57.32	72.15
SDev	.40	.36	.47
%RSD	.7567	.6210	.6449
#1	52.63	56.92	71.61
#2	53.19	57.48	72.36
#3	53.41	57.58	72.47

Method: COE Slope = Conc(SIR)/IR

Element	Wavelen	High std	Low std	Slope	Y-intercept	Date Standardized
Ag3280	328.068	Multiple	Standards	278.957	-5.58934	02/19/96 02:29:13
Al3082	308.215	Multiple	Standards	754.082	-38.5836	02/19/96 02:29:13
As1936	193.696	Multiple	Standards	376.400	-11.5346	02/19/96 02:35:36
Ba4934	493.409	Multiple	Standards	103.169	-.305465	02/19/96 02:29:13
Be3130	313.042	Multiple	Standards	9.29323	-.693637	02/19/96 02:29:13
Cd2288	228.802	Multiple	Standards	238.916	-.620752	02/19/96 02:29:13
Cr2677	267.716	Multiple	Standards	100.313	-1.74086	02/19/96 02:29:13
Fe2599	259.940	Multiple	Standards	66.9932	-1.16682	02/19/96 02:29:13
Ni2316	231.604	Multiple	Standards	67.0980	-2.77140	02/19/96 02:29:13
Pb2203	220.353	Multiple	Standards	442.299	-10.6247	02/19/96 02:29:13
Sb2068	206.838	Multiple	Standards	144.568	-3.72224	02/19/96 02:29:13
Se1960	196.026	Multiple	Standards	347.766	2.76479	02/19/96 02:35:36
Tl1908	190.864	Multiple	Standards	276.756	2.19105	02/19/96 02:35:36
V-2924	292.402	Multiple	Standards	115.076	.723887	02/19/96 02:29:13
Zn2138	213.856	Multiple	Standards	99.2776	-.917049	02/19/96 02:29:13

Method: ICP

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ag3280	328.068	S0	.000000	-.010199	.010199
		S1A	250.000	251.237	-1.23703
		S1B	500.000	499.137	.863251
		S1	1000.00	994.378	5.62170

CorCoef: 1.0000 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Al3082	308.215	S0	.000000	.125942	-.125942
		S1A	2500.00	2442.85	57.1511
		S1B	5000.00	4937.35	62.6475
		S1	10000.0	9896.70	103.302

CorCoef: 0.99999 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
As1936	193.696	S0	.000000	-.242593	.242593
		S2A	5000.00	5044.27	-44.2725
		S2B	10000.0	9928.44	71.5596
		S2	20000.0	19966.0	33.9707

CorCoef: 0.99999 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ba4934	493.409	S0	.000000	.175991	-.175991
		S1A	2500.00	2469.00	30.9976
		S1B	5000.00	5045.19	-45.1929
		S1	10000.0	10033.6	-33.6045

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Be3130	313.042	S0	.000000	.008524	-.008524
		S1A	125.000	127.100	-2.09958
		S1B	250.000	259.183	-9.18317
		S1	500.000	516.135	-16.1352

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Cd2288	228.802	S0	.000000	.010323	-.010323
		S1A	125.000	122.814	2.18578
		S1B	250.000	254.856	-4.85628
		S1	500.000	499.031	.969421

CorCoef: 0.99990 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Cr2677	267.716	S0	.000000	-.002112	.002112
		S1A	250.000	249.375	.625046
		S1B	500.000	505.439	-5.43948
		S1	1000.00	991.621	8.37885

CorCoef: 0.99994 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Fe2599	259.940	S0	.000000	-.050265	.050265
		S1A	2500.00	2499.55	.445313
		S1B	5000.00	5042.88	-42.8843
		S1	10000.0	9916.01	83.9863

CorCoef: 0.99995 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ni2316	231.604	S0	.000000	-.042744	.042744
		S1A	1000.00	1003.21	-3.20667
		S1B	2000.00	2014.96	-14.9551
		S1	4000.00	3957.26	42.7366

CorCoef: 0.99995

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Pb2203	220.353	S0	.000000	-.009556	.009556
		S1A	1250.00	1249.93	.071167
		S1B	2500.00	2534.07	-34.0715
		S1	5000.00	4971.14	28.8584

CorCoef: 0.99994

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Sb2068	206.838	S0	.000000	.036517	-.036517
		S1A	1500.00	1479.54	20.4578
		S1B	3000.00	2997.79	2.20776
		S1	6000.00	5942.64	57.3643

CorCoef: 0.99998

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Se1960	196.026	S0	.000000	-.249182	.249182
		S2A	5000.00	5042.13	-42.1304
		S2B	10000.0	9946.56	53.4375
		S2	20000.0	19938.4	61.6465

CorCoef: 0.99999

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Tl1908	190.864	S0	.000000	-.207502	.207502
		S2A	5000.00	5037.68	-37.6753
		S2B	10000.0	9939.95	60.0527
		S2	20000.0	19969.4	30.5996

CorCoef: 0.99999

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
V-2924	292.402	S0	.000000	.033434	-.033434
		S1A	1250.00	1242.16	7.84106
		S1B	2500.00	2521.80	-21.7991
		S1	5000.00	4990.02	9.98389

CorCoef: 0.99998

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Zn2138	213.856	S0	.000000	.009542	-.009542
		S1A	500.000	501.626	-1.62607
		S1B	1000.00	1016.81	-16.8106
		S1	2000.00	2011.17	-11.1749

CorCoef: 0.99998

Analysis Report QC Standard Mon 02-19-96 02:41:29 PM page 1

Method: COE Sample Name: STD1 Operator: PMP
Run Time: 02/19/96 14:39:14
Comment:
Mode: CONC Corr. Factor. 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	968.4	9933.	-15.83	9766.	477.5	495.9	973.0
SDev	5.5	24.	7.33	41.	.3	3.8	1.6
%RSD	.5680	.2383	46.17	.4167	.0562	.7577	.1667
#1	966.7	9927.	-16.99	9720.	477.3	495.2	973.9
#2	963.9	9913.	-8.055	9783.	477.5	492.6	973.9
#3	974.6	9959.	-22.59	9796.	477.8	500.0	971.1
Errors	QC Pass	QC Pass	NOCHECK	QC Pass	QC Pass	QC Pass	QC Pass
Value	1000.	10000.		10000.	500.0	500.0	1000.
Range	5.000	5.000		5.000	5.000	5.000	5.000

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	9734.	3891.	4891.	5893.	6.223	15.13	4888.
SDev	19.	17.	12.	31.	10.07	22.20	7.
%RSD	.1993	.4485	.2430	.5322	161.8	146.7	.1345
#1	9716.	3911.	4891.	5929.	1.118	3.178	4881.
#2	9733.	3878.	4879.	5876.	-.2690	1.477	4890.
#3	9754.	3885.	4902.	5874.	17.82	40.74	4894.
Errors	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	NOCHECK	QC Pass
Value	10000.	4000.	5000.	6000.			5000.
Range	5.000	5.000	5.000	5.000			5.000

Elem	Zn2138
Units	ppb
Avge	1942.
SDev	2.
%RSD	.1193
#1	1943.
#2	1939.
#3	1944.
Errors	QC Pass
Value	2000.
Range	5.000

Analysis Report QC Standard Mon 02-19-96 02:45:01 PM page 1

Method: COE Sample Name: STD2 ✓ Operator: PMP
Run Time: 02/19/96 14:42:46
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	2.409	426.6	19600.	.8633	.0878	1.576	-7.760
SDev	1.961	7.1	154.	1.136	.1297	7.158	2.844
%RSD	81.38	1.656	.7867	131.6	147.7	454.3	36.66
#1	2.223	418.9	19530.	-.3055	.1509	-2.367	-8.763
#2	4.457	432.8	19490.	1.964	.1739	9.838	-4.550
#3	.5482	428.1	19770.	.9326	-.0614	-2.744	-9.966
Errors	NOCHECK	NOCHECK	QC Pass ✓	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value			20000.				
Range			5.000				

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.156	5.415	-6.152	97.92	19580.	19780.	6.016
SDev	.507	3.298	10.038	29.01	218.	95.	1.659
%RSD	43.90	60.91	163.2	29.63	1.116	.4782	27.58
#1	1.513	2.999	2.093	88.00	19400.	19700.	4.636
#2	1.379	4.073	-3.219	130.6	19500.	19740.	7.857
#3	.5750	9.172	-17.33	75.17	19820.	19880.	5.556
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass ✓	QC Pass ✓	NOCHECK
Value					20000.	20000.	
Range					5.000	5.000	

Elem	Zn2138
Units	ppb
Avge	-1.062
SDev	.821
%RSD	77.33
#1	-1.709
#2	-.1381
#3	-1.339
Errors	NOCHECK
Value	
Range	

Analysis Report   Blank Sample   Mon 02-19-96 02:50:24 PM   page 1

Method: COE   Sample Name: ICB ✓   Operator: PMP
Run Time. 02/19/96 14:48:09
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.1760	14.41	1.215	.7262	.0149	-.1678	-.4702
SDev	1.162	12.54	8.524	.5459	.0240	1.2212	.8108
%RSD	660.4	87.05	701.5	75.17	161.2	727.8	172.4
#1	1.107	17.47	5.720	.3135	.0203	-1.193	.2654
#2	-1.127	.6184	6.541	.5199	-.0113	1.183	-.3365
#3	.5483	25.14	-8.616	1.345	.0357	-.4932	-1.340
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	18.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.022	-2.727	4.971	-6.189	1.374	-9.618	-.4269
SDev	1.124	3.904	14.99	13.870	18.44	16.945	.2300
%RSD	110.0	143.2	301.6	224.1	1342.	176.2	53.89
#1	.4410	.9861	-.9145	-22.12	.6783	-3.344	-.4268
#2	.3070	-6.797	-6.186	3.227	-16.71	-28.80	-.6569
#3	2.317	-2.369	22.02	.3239	20.15	3.295	-.1969
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	.0201
SDev	.8077
%RSD	4019.
#1	.2680
#2	-.8825
#3	.6748
Errors	LC Pass
High	8.870
Low	-8.870

Analysis Report   QC Standard   Mon 02-19-96 02:52:41 PM   page 1

Method: COE   Sample Name: ISB ✓   Operator: PMP
Run Time: 02/19/96 14:50:27
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1048.	507000.	974.9	478.9	461.3	997.9	464.7
SDev	12.	5251.	34.2	5.8	3.7	4.0	2.4
%RSD	1.160	1.036	3.512	1.220	.8127	.4020	.5252
#1	1057.	510900.	1014.	482.5	464.1	1002.	466.3
#2	1034.	501000.	957.9	472.2	457.1	994.7	461.9
#3	1054.	509200.	952.4	482.1	462.8	996.7	465.9
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1000.	500000.	1000.	500.0	500.0	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	187800.	902.8	968.7	1048.	910.6	1017.	482.9
SDev	1462.	6.2	29.7	6.	17.8	67.	4.3
%RSD	.7788	.6923	3.068	.5356	1.958	6.546	.8872
#1	188900.	902.4	950.5	1047.	928.9	1015.	485.0
#2	186100.	896.7	952.7	1044.	909.4	951.6	477.8
#3	188400.	909.2	1003.	1055.	893.3	1085.	485.5
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200000.	1000.	1000.	1000.	1000.	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Zn2138
Units	ppb
Avge	963.1
SDev	6.9
%RSD	.7162
#1	968.3
#2	955.3
#3	965.8
Errors	QC Pass
Value	1000.
Range	20.00

Analysis Report QC Standard Mon 02-19-96 02:58:03 PM Page 1

Method: COE Sample Name: CRI ✓ Operator: PMP
Run Time: 02/19/96 14:55:48
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	16.76	189.5	380.3	191.7	9.237	11.32	17.72
SDev	4.43	17.0	10.7	4.6	.095	2.29	3.34
%RSD	26.45	8.972	2.822	2.381	1.025	20.26	18.84
#1	20.11	207.4	374.4	187.5	9.144	13.64	20.13
#2	11.73	187.4	373.8	191.2	9.232	11.26	19.12
#3	18.43	173.6	392.7	196.5	9.333	9.055	13.91
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	20.00	200.0	400.0	200.0	10.00	10.00	20.00
Range	50.00	50.00	50.00	50.00	50.00	50.00	50.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	200.8	74.61	102.1	113.4	407.6	401.0	99.89
SDev	2.3	1.98	15.4	21.9	21.4	17.2	2.11
%RSD	1.150	2.651	15.13	19.34	5.256	4.297	2.112
#1	198.3	72.38	117.1	127.2	416.0	419.1	102.2
#2	201.3	76.14	86.21	124.8	423.6	384.8	99.43
#3	202.9	75.33	103.0	88.09	383.3	399.2	98.05
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200.0	80.00	100.0	120.0	400.0	400.0	100.0
Range	50.00	50.00	50.00	50.00	50.00	50.00	50.00

Elem	Zn2138
Units	ppb
Avge	37.36
SDev	.39
%RSD	1.038
#1	36.97
#2	37.35
#3	37.75
Errors	QC Pass
Value	40.00
Range	50.00

Analysis Report

Mon 02-19-96 03:04:01 PM

Method: COE Sample Name: 96LC322-MB1 ✓ Operator: PMP
Run Time: 02/19/96 15:01:46
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-1.312	12.89	-12.84	.6574	-.0666	-.5871	-3.346
SDev	1.706	6.74	6.36	.4295	.0387	1.1489	.723
%RSD	130.0	52.27	49.53	65.33	58.06	195.7	21.62
#1	.5493	8.241	-13.04	.5199	-.0242	.5311	-2.543
#2	-2.801	9.807	-19.09	.3135	-.0758	-1.764	-3.546
#3	-1.684	20.61	-6.379	1.139	-.0999	-.5279	-3.948
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	18.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	14.24	-.4901	-35.02	-14.93	-28.30	7.707	-.1211
SDev	.35	3.2953	11.98	34.46	37.92	9.116	2.0105
%RSD	2.489	672.4	34.20	230.9	134.0	118.3	1661.
#1	13.97	2.328	-47.66	24.80	9.028	13.25	-1.809
#2	14.11	.3151	-23.84	-36.69	-27.14	12.69	-.6580
#3	14.64	-4.113	-33.56	-32.89	-66.78	-2.814	2.103
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	H13.66
SDev	.40
%RSD	2.947
#1	H13.65
#2	H13.26
#3	H14.07
Errors	LC High
High	8.870
Low	-8.870

N/R

Analysis Report Mon 02-19-96 03:06:13 PM page 1

Method: COE Sample Name: 96L0322-LC1 Operator: PMP
Run Time: 02/19/96 15:04:04
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	492.9	5057.	9727.	4987.	236.4	248.9	495.9
SDev	3.4	37.	74.	41.	2.2	3.2	2.9
%RSD	.6898	.7231	.7644	.8255	.9116	1.274	.5895
#1	489.0	5015.	9648.	4939.	234.1	249.3	492.6
#2	495.1	5081.	9739.	5010.	236.9	245.5	497.2
#3	494.5	5076.	9795.	5011.	238.3	251.8	498.0
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	573.5	5705.	11000.	5475.	278.0	287.3	563.5
Low	406.0	4470.	9270.	4440.	222.5	211.3	447.5

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5048.	1966.	2458.	3046.	9766.	9712.	2549.
SDev	45.	21.	33.	26.	100.	64.	23.
%RSD	.8936	1.076	1.323	.8592	1.024	.6612	.9076
#1	4996.	1945.	2422.	3038.	9655.	9680.	2523.
#2	5071.	1965.	2468.	3025.	9794.	9786.	2558.
#3	5077.	1987.	2484.	3076.	9849.	9670.	2566.
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5595.	2206.	2735.	3273.	11000.	10740.	2815.
Low	4420.	1814.	2303.	2778.	9240.	9500.	2255.

Elem	Zn2138
Units	ppb
Avge	986.9
SDev	8.0
%RSD	.8102
#1	978.1
#2	989.0
#3	993.6
Errors	LC Pass
High	1109.
Low	907.0

Analysis Report		Mon 02-19-96 03:03:35 PM		page 1

Method: COE		Sample Name: 96L0322-LC2 ✓		Operator: PMP
Run Time: 02/19/96 15:06:22
Comment:
Mode: CONC	Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	501.4	5127.	9951.	5065.	241.0	251.3	503.5
SDev	4.3	49.	86.	23.	1.3	4.0	3.4
%RSD	.8652	.9577	.8656	.4552	.5198	1.576	.6778
#1	497.9	5083.	9859.	5039.	239.6	255.1	500.0
#2	500.1	5119.	9963.	5082.	241.6	251.6	503.6
#3	506.3	5180.	10030.	5075.	241.9	247.2	506.8
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	573.5	5705.	11000.	5475.	278.0	287.3	563.5
Low	406.0	4470.	9270.	4440.	222.5	211.3	447.5

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5130.	2004.	2484.	3101.	9910.	9944.	2596.
SDev	23.	6.	15.	3.	53.	62.	13.
%RSD	.4519	.2924	.6218	.0857	.5352	.6207	.5023
#1	5104.	2009.	2480.	3104.	9854.	9914.	2581.
#2	5142.	1998.	2501.	3099.	9919.	9903.	2605.
#3	5146.	2004.	2471.	3100.	9959.	10010.	2602.
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5595.	2206.	2735.	3273.	11000.	10740.	2815.
Low	4420.	1814.	2303.	2778.	9240.	9500.	2255.

Elem	Zn2138
Units	ppb
Avge	994.3
SDev	6.0
%RSD	.6011
#1	987.5
#2	996.9
#3	998.5
Errors	LC Pass
High	1109.
Low	907.0

Analysis Report   Mon 02-19-96 03:12:06 PM

Method: COE   Sample Name: 96021964-009   Operator: PMP
Run Time: 02/19/96 15:09:32
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.614	39.91	-15.43	1.276	-.0098	-1.025	-.5371
SDev	4.116	17.42	10.47	.725	.0578	.571	3.8224
%RSD	157.5	43.65	67.85	56.77	590.0	55.76	711.7
#1	.5506	54.21	-7.961	1.345	.0384	-.5034	1.670
#2	-1.125	45.02	-10.94	1.964	.0061	-.9351	1.670
#3	-7.267	20.51	-27.40	.5199	-.0739	-1.636	-4.951
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	29.07	3.670	-6.532	-23.67	-9.747	2.155	-1.196
SDev	1.37	.403	6.201	18.46	24.728	20.57	.133
%RSD	4.708	10.97	94.94	77.99	253.7	954.6	11.10
#1	30.05	4.073	-12.43	-2.881	18.07	21.53	-1.119
#2	29.65	3.267	-.0681	-29.99	-18.09	4.368	-1.119
#3	27.51	3.670	-7.095	-38.15	-29.22	-19.43	-1.349
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	35.95
SDev	.46
%RSD	1.268
#1	35.69
#2	36.48
#3	35.69
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report   Mon 02-19-96 03:15:19 PM   page 1

Method: COE   Sample Name: 9602L964-C13   Operator: PMP
Run Time: 02/19/96 15:13:06
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.785	385.6	-6.999	2.652	-.0240	1.074	7.421
SDev	1.675	14.6	10.576	1.018	.0544	1.026	2.351
%RSD	60.16	3.782	151.1	38.38	226.6	95.52	31.68
#1	-4.460	371.2	-16.70	2.171	-.0732	2.021	5.682
#2	-1.110	400.4	-8.565	3.821	.0345	-.0162	10.10
#3	-2.785	385.1	4.272	1.964	-.0333	1.218	6.485
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	214.6	36.73	22.43	-24.00	-4.367	3.197	.0173
SDev	3.1	2.18	2.34	26.74	9.596	8.474	1.509
%RSD	1.467	5.941	10.42	111.4	219.8	265.1	8706.
#1	211.5	34.27	24.21	-54.14	-15.26	6.341	-1.593
#2	217.8	37.49	23.29	-3.113	-.6563	9.650	.2472
#3	214.7	38.43	19.78	-14.76	2.821	-6.400	1.398
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	1303.
SDev	4.
%RSD	.2695
#1	1307.
#2	1302.
#3	1300.
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report   Mon 02-19-96 03:18.32 PM

Method: COE   Sample Name: 9602L964-018   Operator: PMP
Run Time: 02/19/96 15:16:18
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.0020	211.9	-17.08	2.033	-.0549	1.868	5.415
SDev	2.434	13.4	7.11	.596	.0432	1.938	2.325
%RSD	123800.	6.303	41.60	29.30	78.73	103.8	42.94
#1	-1.115	202.7	-16.80	1.345	-.0235	-.3663	8.090
#2	-1.673	205.8	-24.33	2.377	-.0370	3.095	3.877
#3	2.794	227.2	-10.12	2.377	-.1041	2.875	4.278
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	152.2	7.696	4.127	11.30	-9.252	1.439	-2.356
SDev	2.2	3.910	9.810	13.67	18.155	5.830	.531
%RSD	1.415	50.81	237.7	121.0	196.2	405.1	22.56
#1	153.7	3.402	-6.449	-.5572	11.15	6.972	-2.049
#2	153.1	8.635	5.899	26.26	-15.28	-4.649	-2.970
#3	149.7	11.05	12.93	8.197	-23.63	1.996	-2.049
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	5797.
SDev	15.
%RSD	.2558
#1	5781.
#2	5803.
#3	5809.
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report Mon 02-19-96 03:21:44 PM page 1

Method: COE Sample Name: 9602L964-021 Operator: PMP
Run Time: 02/19/96 15:19:30
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.7698	917.2	-2.629	4.578	-.0437	49.11	16.52
SDev	2.639	22.9	13.865	.781	.0720	2.33	2.04
%RSD	342.8	2.501	527.3	17.06	164.7	4.751	12.33
#1	2.817	942.7	11.07	5.472	-.1136	46.51	14.31
#2	-2.208	910.5	-16.65	4.234	-.0478	49.80	16.92
#3	1.700	898.3	-2.314	4.028	.0302	51.02	18.32
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	444.1	18.39	109.4	-2.696	13.31	11.37	6.904
SDev	1.6	4.27	16.4	15.315	20.74	22.82	.460
%RSD	.3557	23.20	14.95	568.1	155.8	200.8	6.668
#1	444.5	13.60	90.52	9.149	-8.944	37.01	6.904
#2	445.4	19.77	119.7	-19.99	16.79	3.801	6.443
#3	442.3	21.79	117.9	2.753	32.09	-6.713	7.364
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	513.6
SDev	3.1
%RSD	.6110
#1	515.4
#2	515.5
#3	510.0
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report Mon 02-19-96 03:24:56 PM Page 1

Method: COE Sample Name: 9602L964-025 Operator: PMP
Run Time: 02/19/96 15:22:43
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.691	971.0	-1.673	20.05	.0989	5.292	301.1
SDev	1.675	12.4	7.573	.32	.0615	2.699	1.6
%RSD	99.07	1.274	452.8	1.572	62.16	51.00	.5427
#1	3.366	984.3	-2.733	20.12	.0601	8.017	299.2
#2	.0158	968.9	-8.660	19.71	.0667	5.241	301.8
#3	1.691	959.8	6.375	20.33	.1697	2.619	302.2
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	322.5	57.17	76.37	98.75	-24.28	12.62	13.43
SDev	2.1	1.88	4.92	26.51	8.43	15.52	1.76
%RSD	.6442	3.289	6.443	26.85	34.74	123.0	13.09
#1	320.9	57.75	75.47	108.7	-34.01	30.52	13.82
#2	324.8	55.07	71.96	68.71	-19.41	4.506	11.51
#3	321.6	58.69	81.68	118.9	-19.41	2.843	14.97
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	1374.
SDev	15.
%RSD	1.074
#1	1368.
#2	1391.
#3	1364.
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report QC Standard Mon 02-19-96 03:29:05 PM

Method: COE Sample Name: CCV ✓ Operator: PMP
Run Time: 02/19/96 15:26:51
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	504.8	5094.	10520.	4957.	241.9	265.8	506.0
SDev	2.8	23.	34.	28.	1.1	3.5	2.4
%RSD	.5570	.4422	.3240	.5558	.4358	1.313	.4697
#1	505.2	5082.	10490.	4930.	241.3	264.9	507.2
#2	501.8	5079.	10500.	4957.	241.3	262.8	503.2
#3	507.4	5120.	10560.	4985.	243.2	269.6	507.4
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	500.0	5000.	10000.	5000.	250.0	250.0	500.0
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5114.	2030.	2574.	3191.	10500.	10440.	2575.
SDev	21.	14.	30.	7.	28.	77.	13.
%RSD	.4144	.7042	1.184	.2346	.2702	.7381	.4931
#1	5099.	2014.	2608.	3198.	10480.	10350.	2565.
#2	5106.	2037.	2565.	3192.	10480.	10460.	2572.
#3	5139.	2039.	2548.	3183.	10530.	10500.	2589.
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5000.	2000.	2500.	3000.	10000.	10000.	2500.
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Zn2138
Units	ppb
Avge	999.0
SDev	4.7
%RSD	.4700
#1	996.7
#2	996.0
#3	1004.
Errors	QC Pass
Value	1000.
Range	10.00

Analysis Report   Blank Sample   Mon 02-19-96 03:32:37 PM   page 1

Method: COE   Sample Name: CCB ✓   Operator: PMP
Run Time: 02/19/96 15:30:22
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.5684	7.295	.7228	.4511	-.0043	-.9566	-.0690
SDev	1.6750	26.05	1.539	.8339	.0541	3.0867	2.3079
%RSD	294.7	357.2	213.0	184.9	1255.	322.7	3345.
#1	-2.243	-8.486	2.014	-.3055	-.0031	-4.481	-.1359
#2	1.106	37.37	1.135	1.345	-.0591	1.267	-2.343
#3	-.5683	-6.997	-.9808	.3135	.0492	.3441	2.272
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	18.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.602	-2.100	-8.254	-10.26	11.34	-15.16	.6470
SDev	1.697	2.681	4.091	11.82	3.50	8.79	1.497
%RSD	105.9	127.6	49.57	115.2	30.86	58.00	231.4
#1	1.915	-.7585	-10.59	1.802	14.59	-20.51	2.104
#2	-.2289	-5.187	-10.65	-10.76	7.633	-19.95	-.8870
#3	3.121	-.3559	-3.530	-21.82	11.81	-5.010	.7235
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	-.7699
SDev	.2214
%RSD	28.75
#1	-.9065
#2	-.8888
#3	-.5145
Errors	LC Pass
High	8.870
Low	-8.870

Analysis Report

Mon 02-19-96 03:34:54 PM

Method: COE Sample Name: 9602L964-026 Operator: PMP
Run Time: 02/19/96 15:32:41
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.688	859.1	-1.666	15.79	.0592	2.266	218.7
SDev	1.675	3.2	9.059	.55	.0303	1.028	1.2
%RSD	99.24	.3715	543.6	3.458	51.26	45.36	.5530
#1	3.363	861.6	7.623	16.20	.0940	2.122	218.5
#2	1.688	855.5	-2.147	15.17	.0443	1.318	217.5
#3	.0128	860.1	-10.48	16.00	.0391	3.358	219.9
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	289.2	17.27	68.58	91.46	.0579	-5.589	8.526
SDev	1.2	2.59	13.87	9.98	13.96	33.217	1.218
%RSD	.4204	15.00	20.22	10.91	24130.	594.3	14.28
#1	290.5	20.18	78.28	80.86	13.27	30.57	7.605
#2	289.0	15.21	74.76	100.7	1.449	-12.60	8.066
#3	288.1	16.42	52.69	92.83	-14.55	-34.74	9.907
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	3131.
SDev	3.
%RSD	.0851
#1	3133.
#2	3128.
#3	3132.
Errors	LC Pass
High	100000.
Low	-8.870

Analysis Report QC Standard Mon 02-19-96 03:38:08 PM page 1

Method: COE Sample Name: ISB Operator: PMP
Run Time: 02/19/96 15:35:54
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1066.	517100.	939.3	489.8	469.1	1006.	470.8
SDev	6.	5421.	33.8	3.8	5.6	10.	4.3
%RSD	.5781	1.048	3.594	.7680	1.185	1.002	.9192
#1	1063.	516000.	957.2	489.1	467.0	1005.	468.9
#2	1061.	512300.	900.3	486.4	464.8	996.0	467.7
#3	1073.	523000.	960.2	493.9	475.3	1016.	475.7
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1000.	500000.	1000.	500.0	500.0	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	190300.	916.3	947.4	1038.	899.4	983.1	490.0
SDev	1792.	13.5	28.0	40.	7.9	7.0	4.4
%RSD	.9418	1.478	2.957	3.846	.8749	.7088	.8968
#1	190000.	906.0	964.2	1018.	908.4	980.2	486.3
#2	188700.	911.2	915.1	1012.	896.2	978.1	488.9
#3	192200.	931.6	963.0	1084.	893.6	991.0	494.9
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200000.	1000.	1000.	1000.	1000.	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Zn2138
Units	ppb
Avge	977.8
SDev	9.6
%RSD	.9850
#1	975.3
#2	969.7
#3	988.4
Errors	QC Pass
Value	1000.
Range	20.00

Analysis Report QC Standard Mon 02-19-96 03:43:30 PM

Method: COE Sample Name: CCV Operator: PMP
Run Time: 02/19/96 15:41:15
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	502.2	5082.	10480.	4939.	241.0	263.2	503.8
SDev	3.3	39.	88.	57.	2.4	2.1	7.4
%RSD	.6519	.7723	.8422	1.156	1.008	.7919	1.460
#1	503.5	5110.	10570.	5004.	243.7	265.6	506.6
#2	504.6	5099.	10470.	4912.	240.2	261.9	509.3
#3	498.5	5037.	10390.	4900.	239.1	262.1	495.4
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	500.0	5000.	10000.	5000.	250.0	250.0	500.0
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5085.	2006.	2551.	3183.	10470.	10380.	2562.
SDev	38.	7.	31.	49.	132.	77.	19.
%RSD	.7455	.3554	1.207	1.530	1.261	.7427	.7561
#1	5127.	2011.	2568.	3223.	10610.	10470.	2585.
#2	5075.	2008.	2571.	3197.	10440.	10320.	2553.
#3	5053.	1998.	2516.	3128.	10350.	10350.	2549.
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5000.	2000.	2500.	3000.	10000.	10000.	2500.
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Zn2138
Units	ppb
Avge	996.7
SDev	6.4
%RSD	.6436
#1	1004.
#2	994.0
#3	992.0
Errors	QC Pass
Value	1000.
Range	10.00

Analysis Report   Blank Sample   Mon 02-19-96 03:47:02 PM   page 1

Method: COE   Sample Name: CCB   Operator: PMP
Run Time: 02/19/96 15:44:48
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.7545	4.236	-11.06	.3823	.0597	-2.367	2.539
SDev	3.0752	9.355	11.30	.6304	.0359	1.393	1.336
%RSD	407.6	220.8	102.2	164.9	60.02	58.84	52.61
#1	-2.802	-3.969	-18.29	-.3055	.1009	-.8212	3.676
#2	2.782	14.42	-16.86	.9326	.0351	-2.755	2.874
#3	-2.243	2.255	1.962	.5199	.0433	-3.524	1.068
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	18.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	2.406	.7624	5.867	-19.68	16.44	2.002	.8003
SDev	.409	1.076	7.141	2.11	7.66	14.10	1.742
%RSD	17.01	141.2	121.7	10.73	46.59	704.4	217.7
#1	2.853	.8519	14.11	-18.33	20.15	-7.222	-.4270
#2	2.317	1.791	1.736	-22.11	21.54	-5.008	.0333
#3	2.049	-.3559	1.752	-18.59	7.634	18.24	2.795
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Elem	Zn2138
Units	ppb
Avge	.3999
SDev	.9867
%RSD	246.8
#1	.2682
#2	1.446
#3	-.5144
Errors	LC Pass
High	8.870
Low	-8.870

STATUS INFORMATION **

Version: 66.0
Date Created: 07/31/91 08:49 Date Last Updated: 02/19/96 02:10

Number of elements: 15 Number of lines: 15

# of lines calibrated: 0
# of lines standardized: 15 02/19/96 02:29 - 02/19/96 02:35

Data collection mode: Spectrum Shifter <4 positions>

Approx. time for analysis 1.8 mins.

Protection status: Un-protected

METHOD INFORMATION **

Sample Introduction Device: Normal
Calibration Mode: Concentration

Default Setup:

Number of Repeats : 3
Flush Time (sec) : 50.0
Auto-Increment Sample Names? No

Auto-store Analysis Data? Yes
Auto-store Stdzn Data? Yes
Store Individual Repeats? Yes
Auto-print Analysis Data? Yes
Auto-print Stdzn Report : +Readback
Condensed Print Format? No

Default File Names:

Analysis Data File : PS0219B
Calibration Data File : PS0219B
Calibration Stds Table : PS0219B

Autosampler Table : COE
Sample Limits Table : LR846
Blank Limits Table : MB846
QC Check Table : CCV

INTERNAL STANDARDS INFORMATION **

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
1	Time		0	5.0	Yes

Ratio Constant/Intensity Multiplication Factor: .1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
2	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
3	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
4	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
5	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
6	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem Symbol	Wavelength	Pre-integration	Integration	Used?
7	Time		0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

OUTPUT INFORMATION **

Output Mode:	Concentration
Override Print Limits?	Yes
Override Significant Figures?	No
Apply Background Correction?	Yes
Apply Blank Subtraction?	No
Limits Table: LR846 Check?	Yes
Correction Factor:	1

Report to:

Screen	Avgs
Printer	Avgs, Stats, Reps, Errs, Units

PLASMA INFORMATION **

Gas Flow Rates

Torch gas flow : High Flow
Auxiliary gas flow: Medium (1.0 L/min)

Peristaltic Pump Parameters

Flush Pump Rate (RPM): 100
Relaxation time (sec): 0
Pump Tubing type : Tygon-Orange

Plasma Parameters

	Group #1	Group #2	Group #3	Group #4	Special Group
Approximate RF Power (W):	1150	1350	950	1750	1150
Analysis Pump Rate (RPM):	100	100	100	100	100
Nebulizer Pressure (PSI):	30	30	30	30	30

Element:	Ag	Al	As	Ba	Be
Wavelength:	328.068	308.215/2	193.696	493.409	313.042
Element Name:	Ag3280	Al3082	As1936	Ba4934	Be3130
Line Switch Conc:	0	0	0	0	0
Peak SS Offset:	0	0	0	0	0
Timing Group No.:	1	1	1	1	1
Print Limit Low:	0	0	0	0	0
Print Limit High:	0	0	0	0	0
Significant Figrs:	4	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	NONE	NONE	NONE	-15
BKG High SS Offset:	15	15	15	15	NONE
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0	S0
Conc/Sig:	0	0	0	0	0
Std #2 (Low) Name:	S1A	S1A	S2A	S1A	S1A
Conc/Sig:	250	2500	5000	2500	125
Std #3 Name:	S1B	S1B	S2B	S1B	S1B
Conc:	500	5000	10000	5000	250
Std #4 Name:	S1	S1	S2	S1	S1
Conc:	1000	10000	20000	10000	500
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Y - intercept:	-5.59381	-39.1807	-11.5346	-.305463	-.67435
Slope:	279.18	765.752	376.4	103.169	8.06264
Date Standardized:	02/19/96	02/19/96	02/19/96	02/19/96	02/19/96
Time Standardized:	14:29	14:29	14:35	14:29	14:29
Offset (A0):	0	0	0	0	0
Gain (A1):	1	1	1	1	1
Curvature (A2):	0	0	0	0	0
Exponent (n):	1	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:					
Use IECs:	YES	YES	YES	NO	YES
Number of IECs:	2	1	3	0	1

Affecting Element:	Fe2599	V-2924	A13082	--n/a--	V-2924
k1 factor:	-.00008	-.03048	.0038	--n/a--	.00286
k2 factor:	0	0	0	--n/a--	0
use?:	YES	YES	YES	--n/a--	YES
Affecting Element:	V-2924	--n/a--	Fe2599	--n/a--	--n/a--
k1 factor:	-.0082	--n/a--	.0001	--n/a--	--n/a--
k2 factor:	0	--n/a--	0	--n/a--	--n/a--
use?:	NO	--n/a--	YES	--n/a--	--n/a--
Affecting Element:	--n/a--	--n/a--	V-2924	--n/a--	--n/a--
k1 factor:	--n/a--	--n/a--	.01617	--n/a--	--n/a--
k2 factor:	--n/a--	--n/a--	0	--n/a--	--n/a--
use?:	--n/a--	--n/a--	YES	--n/a--	--n/a--

Element:	Cd	Cr	Fe	Ni	Pb
Wavelength:	228.802/2	267.716	259.940	231.604/2	220.353
Element Name:	Cd2288	Cr2677	Fe2599	Ni2316	Pb2203
Line Switch Conc:	0	0	0	0	0
Peak SS Offset:	0	0	0	0	0
Timing Group No.:	1	1	1	1	1
Print Limit Low:	0	0	0	0	0
Print Limit High:	0	0	0	0	0
Significant Figrs:	4	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	-15	-15	-15	-15
BKG High SS Offset:	15	NONE	NONE	NONE	NONE
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0	S0
Conc/Sig:	0	0	0	0	0
Std #2 (Low) Name:	S1A	S1A	S1A	S1A	S1A
Conc/Sig:	125	250	2500	1000	1250
Std #3 Name:	S1B	S1B	S1B	S1B	S1B
Conc:	250	500	5000	2000	2500
Std #4 Name:	S1	S1	S1	S1	S1
Conc:	500	1000	10000	4000	5000
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--

Y - intercept:	-.626792	-1.74086	-1.16682	-2.7714	-10.5972
Slope:	233.918	100.313	66.9932	67.098	441.152
Date Standardized:	02/19/96	02/19/96	02/19/96	02/19/96	02/19/96
Time Standardized:	14:29	14:29	14:29	14:29	14:29
Offset (A0):	0	0	0	0	0
Gain (A1):	1	1	1	1	1
Curvature (A2):	0	0	0	0	0
Exponent (n):	1	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:					
Use IECs:	YES	NO	NO	NO	YES
Number of IECs:	1	0	0	0	1
Affecting Element:	As1936	--n/a--	--n/a--	--n/a--	Al3082
k1 factor:	.0155	--n/a--	--n/a--	--n/a--	.0013
k2 factor:	0	--n/a--	--n/a--	--n/a--	0
use?:	YES	--n/a--	--n/a--	--n/a--	YES

Method: COE   Element Information   Mon 02-19-96 04:23:30 PM

Element:	Sb	Se	Tl	V	Zn
Wavelength:	206.838	196.026	190.864/2	292.402	213.856
Element Name:	Sb2068	Se1960	Tl1908	V-2924	Zn2138
Line Switch Conc:	0	0	0	0	0
Peak SS Offset:	0	0	0	0	0
Timing Group No.:	1	1	1	1	1
Print Limit Low:	0	0	0	0	0
Print Limit High:	0	0	0	0	0
Significant Figrs:	4	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	-15	NONE	NONE	NONE
BKG High SS Offset:	15	NONE	15	29	15
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0	S0
Conc/Sig:	0	0	0	0	0
Std #2 (Low) Name:	S1A	S2A	S2A	S1A	S1A
Conc/Sig:	1500	5000	5000	1250	500
Std #3 Name:	S1B	S2B	S2B	S1B	S1B
Conc:	3000	10000	10000	2500	1000
Std #4 Name:	S1	S2	S2	S1	S1
Conc:	6000	20000	20000	5000	2000
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Y - intercept:	-3.75218	2.76479	2.19105	.723779	-.909275
Slope:	145.73	347.766	276.756	115.058	98.436
Date Standardized:	02/19/96	02/19/96	02/19/96	02/19/96	02/19/96
Time Standardized:	14:29	14:35	14:35	14:29	14:29
Offset (A0):	0	0	0	0	0
Gain (A1):	1	1	1	1	1
Curvature (A2):	0	0	0	0	0
Exponent (n):	1	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:					
Use IECs:	YES	YES	YES	YES	YES
Number of IECs:	3	1	2	1	2

Affecting Element:	As1936	Fe2599	Fe2599	Fe2599	Fe2599
k1 factor:	.00008	-.00026	.00133	.000075	.00013
k2 factor:	0	0	0	0	0
use?:	YES	YES	YES	YES	YES
Affecting Element:	V-2924	--n/a--	V-2924	--n/a--	Ni2316
k1 factor:	-.00843	--n/a--	.0018	--n/a--	.00395
k2 factor:	0	--n/a--	0	--n/a--	0
use?:	YES	--n/a--	YES	--n/a--	YES
Affecting Element:	Ni2316	--n/a--	--n/a--	--n/a--	--n/a--
k1 factor:	-.00143	--n/a--	--n/a--	--n/a--	--n/a--
k2 factor:	0	--n/a--	--n/a--	--n/a--	--n/a--
use?:	YES	--n/a--	--n/a--	--n/a--	--n/a--

Standardization Rpt. Tue 02-20-96 06:53:33 PM

Method: COE Standard: S0

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Avge	.0107	.0447	.0013	-.002[illegible]	.0807	-.0053	-.0093
SDev	.0153	.0214	.023[illegible]	.0035	.0070	.0061	.0280
%RSD	143.2	47.88 IEC	1758.	173.2	8.707	114.6	300.3
#1	.01[illegible]	.0260	-.0160	-.0060	.0880	-.0040	-.0080
#2	-.0060	.0400	-.0080	.0000	.0740	-.0120	-.0380
#3	.0240	.0680	.0280	.0000	.0800	.0000	.0130

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Avge	.0007	.0067	.0167	-.0900	.0673	-.0527	-.0387
SDev	.0311	.0297	.0291	.0964	.0546	.0220	.0190
%RSD	4670 IEC	445.3	174.9	107.2	81.09	41.83	49.16 IEC
#1	.0040	-.0260	.0400	-.0500	.1260	-.0730	-.0380
#2	-.0320	.0140	-.0160	-.2000	.0130	-.0380	-.0580
#3	.0300	.0320	.0260	-.0200	.0580	-.0420	-.0200

COE-HOT
GAS
SW846

1 COPY

No Return

retrieved
updated

PMP
02-20-96

PS0220B IC3.2
96L0322- Batch
96021964-023
-024

PMP
2-20-96

Standardization Rpt. Tue 02-20-96 06:55:51 PM page 1

Method: COE Standard: S1A

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	.9527	3.329	24.43	16.45	.5527	2.637	39.62
SDev	.0129	.019	.24	.14	.0110	.040	.27
%RSD	1.350	.5709	.9624	.8669	1.993	1.517	.6722
#1	.9380	3.310	24.22	16.32	.5600	2.636	39.39
#2	.9620	3.330	24.69	16.60	.5580	2.678	39.91
#3	.9580	3.348	24.40	16.43	.5400	2.598	39.55

Elem	Ni2316	Pb2203	Sb2068	V-2924
Avge	15.92	3.034	10.92	[illegible]
SDev	.07	.031	.14	[illegible]
%RSD	.4610	1.023	1.284	.5834
#1	15.93	2.998	10.90	11.39
#2	15.99	3.052	11.07	11.52
#3	[illegible]	3.052	10.79	11.44

Standardization Rpt.   Tue 02-20-96 06:58:09 PM   page 1

Method: COE   Standard: S1B

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	1.848	6.553	47.70	32.02	1.087	5.123	77.00
SDev	.017	.046	.51	.25	.017	.031	.61
%RSD	.9425	.7029	1.063	.7840	1.586	.6078	.7936
#1	1.829	6.508	47.15	31.77	1.084	5.090	76.36
#2	1.860	6.600	48.16	32.27	1.106	5.126	77.57
#3	1.856	6.550	47.78	32.03	1.072	5.152	77.07

Elem	Ni2316	Pb2203	Sb2068	V-2924
Avge	30.77	5.939	21.17	22.31
SDev	.29	.033	.12	.19
%RSD	.9565	.5598	.5756	.8371
#1	30.43	5.934	21.03	22.10
#2	30.91	5.974	21.25	22.46
#3	30.96	5.909	21.23	22.36

Method: COE Standard: S1

Elem	Ag3280	Al3082	Ba4934	Be3130	Cd2288	Cr2677	Fe2599
Avge	3.662	13.19	96.83	64.55	2.169	10.26	153.9
SDev	.028	.1	.70	.31	.010	.05	.9
%RSD	.7704	.7482	.7181	.4845	.4731	.4885	.5751
#1	3.636	13.08	96.03	64.20	2.178	10.21	152.9
#2	3.658	13.20	97.22	64.69	2.158	10.31	154.4
#3	3.692	13.28	97.25	64.77	2.172	10.26	154.5

Elem	Ni2316	Pb2203	Sb2068	V-2924
Avge	61.33	11.80	42.49	44.88
SDev	.27	.04	.42	.27
%RSD	.4384	.3502	.9988	.6081
#1	61.05	11.76	42.03	44.56
#2	61.37	11.85	42.57	45.01
#3	61.58	11.80	42.87	45.06

Standardization Rpt.

Method: COE Standard: S2A

Elem	As1936	Se1960	Tl1908
Avge	13.57	14.75	18.58
SDev	.06	.05	.09
%RSD	.4058	.3152	.5089
#1	13.54	14.71	18.53
#2	13.64	14.80	18.51
#3	13.55	14.73	18.68

Method: COE Standard: S2B

Elem	As1936	Se1960	T11908
Avge	27.66	29.89	37.58
SDev	.32	.19	.26
%RSD	1.144	.6279	.6790
#1	27.48	30.05	37.34
#2	28.02	29.93	37.85
#3	27.47	29.69	37.55

Standardization Rpt.

Method: COE Standard: S2

Elem	As1936	Se1960	Tl1908
Avge	55.06	59.54	74.47
SDev	.36	.43	.24
%RSD	.6539	.7148	.3280
#1	55.42	60.00	74.75
#2	55.06	59.45	74.37
#3	54.70	59.16	74.29

Standardization Report

Method: COE

Slope = Conc(SIR)/IR

Element	Wavelen	High std	Low std	Slope	Y-intercept	Date Standardized
Ag3280	328.068	Multiple	Standards	270.220	-2.91378	02/20/96 06:58:13
Al3082	308.215	Multiple	Standards	751.753	-33.5941	02/20/96 06:58:13
As1936	193.696	Multiple	Standards	364.384	-.173891	02/20/96 07:04:36
Ba4934	493.409	Multiple	Standards	103.460	.077327	02/20/96 06:58:13
Be3130	313.042	Multiple	Standards	7.96021	-.651426	02/20/96 06:58:13
Cd2288	228.802	Multiple	Standards	227.562	1.20062	02/20/96 06:58:13
Cr2677	267.716	Multiple	Standards	96.4082	.867927	02/20/96 06:58:13
Fe2599	259.940	Multiple	Standards	64.3303	-.346711	02/20/96 06:58:13
Ni2316	231.604	Multiple	Standards	64.3498	-.581742	02/20/96 06:58:13
Pb2203	220.353	Multiple	Standards	421.300	-7.14030	02/20/96 06:58:13
Sb2068	206.838	Multiple	Standards	138.291	12.2356	02/20/96 06:58:13
Se1960	196.026	Multiple	Standards	337.359	-22.4428	02/20/96 07:04:36
Tl1908	190.864	Multiple	Standards	267.505	14.1321	02/20/96 07:04:36
V-2924	292.402	Multiple	Standards	110.669	4.15358	02/20/96 06:58:13

Standardization Readback Report Tue 02-20-96 07:06:36 PM page 1

Method: COE

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ag3280	328.068	S0	.000000	-.031434	.031434
		S1A	250.000	254.516	-4.51576
		S1B	500.000	496.453	3.54736
		S1	1000.00	986.632	13.3683

CorCoef: 0.99996 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Al3082	308.215	S0	.000000	-.015825	.015825
		S1A	2500.00	2469.24	30.7563
		S1B	5000.00	4892.40	107.604
		S1	10000.0	9881.03	118.969

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
As1936	193.696	S0	.000000	.311955	-.311955
		S2A	5000.00	4945.49	54.5073
		S2B	10000.0	10077.5	-77.4814
		S2	20000.0	20063.1	-63.0684

CorCoef: 0.99999 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ba4934	493.409	S0	.000000	-.129093	.129093
		S1A	2500.00	2528.09	-28.0933
		S1B	5000.00	4934.71	65.2852
		S1	10000.0	10018.2	-18.1973

CorCoef: 0.99995 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Be3130	313.042	S0	.000000	-.009302	.009302
		S1A	125.000	130.299	-5.29938
		S1B	250.000	254.245	-4.24518
		S1	500.000	513.212	-13.2121

CorCoef: 0.99997 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Cd2288	228.802	S0	.000000	-.013047	.013047
		S1A	125.000	126.967	-1.96677
		S1B	250.000	248.637	1.36319
		S1	500.000	494.859	5.14069

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Cr2677	267.716	S0	.000000	-.031882	.031882
		S1A	250.000	255.128	-5.12848
		S1B	500.000	494.735	5.26501
		S1	1000.00	990.016	9.98395

CorCoef: 0.99996 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Fe2599	259.940	S0	.000000	-.303824	.303824
		S1A	2500.00	2548.34	-48.3352
		S1B	5000.00	4953.05	46.9536
		S1	10000.0	9900.56	99.4355

CorCoef: 0.99997 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ni2316	231.604	S0	.000000	-.152743	.152743
		S1A	1000.00	1023.82	-23.8244
		S1B	2000.00	1979.25	20.7524
		S1	4000.00	3946.21	53.7932

CorCoef: 0.99995 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Pb2203	220.353	S0	.000000	-.119138	.119138
		S1A	1250.00	1271.08	-21.0822
		S1B	2500.00	2494.82	5.18286
		S1	5000.00	4965.04	34.9629

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Sb2068	206.838	S0	.000000	-.210548	.210548
		S1A	1500.00	1522.19	-22.1871
		S1B	3000.00	2939.58	60.4241
		S1	6000.00	5888.49	111.510

CorCoef: 0.99995 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Se1960	196.026	S0	.000000	.272652	-.272652
		S2A	5000.00	4953.37	46.6289
		S2B	10000.0	10061.7	-61.6543
		S2	20000.0	20063.2	-63.2109

CorCoef: 0.99999 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Tl1908	190.864	S0	.000000	.043567	-.043567
		S2A	5000.00	4983.12	16.8799
		S2B	10000.0	10066.4	-66.4229
		S2	20000.0	19934.7	65.3301

CorCoef: 0.99998 ✓

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
V-2924	292.402	S0	.000000	-.125611	.125611
		S1A	1250.00	1271.53	-21.5311
		S1B	2500.00	2472.80	27.1973
		S1	5000.00	4970.52	29.4795

✓ CorCoef: 0.99997

Analysis Report   QC Standard   Tue 02-20-96 07:10:21 PM   page 1

Method: COE   Sample Name: STD1 ✓   Operator: PMP
Run Time: 02/20/96 19:08:06
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2283	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	982.4	10120.	.5420	9874.	481.9	492.7	985.0
SDev	5.3	60.	7.754	71.	2.9	3.2	7.0
%RSD	.5351	.5967	1431.	.7235	.6069	.6585	.7058
#1	977.9	10060.	-7.159	9807.	479.5	492.8	979.2
#2	981.2	10120.	.4371	9864.	481.0	495.9	983.1
#3	988.2	10180.	8.348	9949.	485.1	489.4	992.7
Errors	QC Pass ✓	QC Pass ✓	NOCHECK	QC Pass ✓	QC Pass ✓	QC Pass ✓	QC Pass ✓
Value	1000.	10000.		10000.	500.0	500.0	1000.
Range	5.000	5.000		5.000	5.000	5.000	5.000

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	9855.	3943.	4942.	5954.	-24.38	32.79	4940.
SDev	54.	6.	14.	68.	.78	14.86	26.
%RSD	.5477	.1611	.2781	1.142	3.201	45.33	.5257
#1	9804.	3936.	4932.	5912.	-23.94	17.92	4920.
#2	9850.	3946.	4936.	5918.	-25.28	32.82	4931.
#3	9911.	3948.	4957.	6032.	-23.91	47.65	4970.
Errors	QC Pass ✓	QC Pass ✓	QC Pass ✓	QC Pass ✓	NOCHECK	NOCHECK	QC Pass ✓
Value	10000.	4000.	5000.	6000.			5000.
Range	5.000	5.000	5.000	5.000			5.000

Analysis Report QC Standard Tue 02-20-96 07:13:55 PM

Method: COE Sample Name: STD2 ✓ Operator: PMP
Run Time: 02/20/96 19:11:39
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	3.034	498.5	19870.	.4917	.1083	9.122	-6.845
SDev	4.083	13.8	280.	.8277	.0642	3.366	2.416
%RSD	134.6	2.778	1.408	168.3	59.33	36.90	35.30
#1	6.820	511.1	20180.	1.319	.0598	5.316	-6.652
#2	-1.293	483.7	19650.	-.3360	.1811	10.34	-4.531
#3	3.574	500.5	19770. ✓	.4917	.0838	11.71	-9.351
Errors	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value			20000.				
Range			5.000				

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	2.312	.5766	-13.09	92.50	19800.	19810.	7.694
SDev	1.629	4.359	20.88	18.42	243.	211.	1.232
%RSD	70.46	756.0	159.5	19.91	1.228	1.063	16.02
#1	1.069	-2.255	-1.904	113.7	20080.	20050.	6.587
#2	4.156	5.596	-.1373	83.88	19650.	19670.	7.472
#3	1.712	-1.611	-37.19	79.97	19660.	19720.	9.022
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass ✓	QC Pass ✓	NOCHECK
Value					20000. ✓	20000. ✓	
Range					5.000	5.000	

Analysis Report   Blank Sample   Tue 02-20-96 07:19:16 PM   page 1

Method: COE   Sample Name: ICB   Operator: PMP
Run Time: 02/20/96 19:17:02
Comment:
Mode: CONC   Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.772	15.39	5.039	.6986	-.0067	.0656	1.061
SDev	2.722	11.28	5.515	.7461	.0186	2.312	.695
%RSD	153.7	73.26	109.4	106.8	276.6	3525.	65.54
#1	4.656	24.05	4.761	1.526	-.0280	1.587	.4823
#2	-.7525	2.642	10.69	.0778	.0061	-2.595	.8679
#3	1.411	19.48	-.3310	.4917	.0017	1.205	1.832
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	13.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-13.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.8112	-2.426	-18.91	17.11	-42.23	11.27	4.596
SDev	.5608	5.430	2.23	19.11	14.97	20.14	.798
%RSD	69.13	223.8	11.80	111.7	35.45	178.7	17.36
#1	1.069	-4.185	-21.44	37.46	-58.20	1.282	4.817
#2	1.197	3.665	-18.05	-.4554	-28.51	34.45	3.710
#3	.1679	-6.759	-17.23	14.32	-39.99	-1.928	5.259
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Method: COE Sample Name: ISB Operator: PMP
Run Time: 02/20/96 19:19:19
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1023.	508300.	949.7	477.9	453.2	958.2	458.5
SDev	8.	5587.	47.0	5.5	4.4	10.0	4.1
%RSD	.8304	1.099	4.952	1.148	.9775	1.045	.8864
#1	1032.	514500.	966.1	483.9	458.2	968.9	463.2
#2	1015.	503600.	986.4	473.1	449.7	949.0	456.1
#3	1023.	506900.	896.7	476.6	451.7	956.7	456.3
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1000.	500000.	1000.	500.0	500.0	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	185000.	891.6	954.4	1003.	915.8	987.8	475.0
SDev	1409.	12.3	10.8	1.	44.1	36.4	3.3
%RSD	.7617	1.379	1.134	.9551	4.819	3.682	.6925
#1	186500.	903.8	948.6	1013.	904.5	996.8	478.8
#2	183700.	891.8	947.6	994.5	964.5	1019.	473.0
#3	184800.	879.2	966.8	1002.	878.5	947.7	473.2
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200000.	1000.	1000.	1000.	1000.	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Analysis Report QC Standard Tue 02-20-96 07:26:55 PM page 1

Method: COE Sample Name: CRI ✓ Operator: PMP
Run Time: 02/20/96 19:24:41
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	20.90	198.1	407.2	204.4	9.667	9.708	19.76
SDev	4.72	3.1	21.5	1.7	.038	2.172	1.74
%RSD	22.56	1.574	5.280	.8246	.3921	22.37	8.780
#1	24.14	198.1	428.1	202.4	9.657	9.102	21.50
#2	23.06	201.2	408.4	205.5	9.635	12.12	18.03
#3	15.49	194.9	385.1	205.1	9.709	7.904	19.76
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	20.00	200.0	400.0	200.0	10.00	10.00	20.00
Range	50.00	50.00	50.00	50.00	50.00	50.00	50.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	209.7	83.54	89.55	115.3	397.7	422.9	103.7
SDev	1.8	3.62	8.07	6.0	12.9	8.1	2.1
%RSD	.8685	4.336	9.015	5.229	3.247	1.915	2.035
#1	210.8	83.97	96.83	108.6	393.9	413.9	103.5
#2	207.6	79.73	90.94	117.0	412.1	425.6	105.9
#3	210.7	86.93	80.87	120.3	387.2	429.4	101.7
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200.0	80.00	100.0	120.0	400.0	400.0	100.0
Range	50.00	50.00	50.00	50.00	50.00	50.00	50.00

Analysis Report

Tue 02-20-96 07:32:16 PM page 1

Method: COE Sample Name: 9602L964-023 Operator: PMP
Run Time: 02/20/96 19:30:02
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	3.465	5184.	.4910	158.6	.1309	10.90	295.7
SDev	5.681	22.	12.72	1.1	.0268	2.60	2.2
%RSD	164.0	.4282	2590.	.6905	20.49	23.82	.7520
#1	9.054	5191.	14.54	159.0	.1598	13.73	293.9
#2	-2.304	5202.	-10.23	159.4	.1067	8.631	298.2
#3	3.644	5159.	-2.844	157.3	.1263	10.34	294.9
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-19.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	880.5	56.99	167.4	119.9	-20.19	22.92	14.19
SDev	4.7	5.29	6.4	14.7	20.65	23.54	2.09
%RSD	.5373	9.290	3.835	12.25	102.3	102.7	14.74
#1	881.6	55.92	174.4	104.5	1.401	1.698	14.93
#2	884.6	62.74	161.8	133.8	-22.21	48.24	11.83
#3	875.3	52.31	166.0	121.3	-39.76	18.82	15.82
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Analysis Report Tue 02-20-96 07:35:46 PM page 1

Method: COE Sample Name: 9602L964-024 Operator: PMP
Run Time: 02/20/96 19:33:32
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	3.584	625.0	.8505	26.43	.0334	.5815	9.737
SDev	.937	18.1	5.776	.43	.0064	1.798	1.767
%RSD	26.14	2.898	679.2	1.630	19.07	309.2	18.15
#1	4.125	604.1	-4.643	26.56	.0261	2.633	7.809
#2	4.125	634.7	.3204	25.94	.0371	-.1694	10.12
#3	2.503	636.3	6.874	26.77	.0371	-.7195	11.28
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	10000.	1000000.	100000.	100000.	2000.	25000.	50000.
Low	-18.00	-111.8	-86.59	-3.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	123.6	5.381	51.73	99.73	-25.11	6.115	3.185
SDev	1.0	5.792	13.20	15.08	20.45	24.41	.894
%RSD	.8133	107.6	25.52	15.13	81.46	399.1	28.08
#1	122.4	-1.225	49.24	93.48	-36.58	29.48	2.152
#2	124.1	9.586	39.96	116.9	-1.494	8.075	3.701
#3	124.2	7.784	66.01	88.77	-37.25	-19.21	3.701
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	250000.	200000.	250000.	120000.	100000.	100000.	25000.
Low	-14.72	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

Analysis Report QC Standard Tue 02-20-96 07:47:09 PM page 1

Method: COE Sample Name: ISB ✓ Operator: PMP
Run Time: 02/20/96 19:44:55
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1028.	510300.	956.0	482.3	452.4	956.3	457.9
SDev	14.	5399.	45.2	5.5	4.3	3.2	3.6
%RSD	1.368	1.058	4.733	1.147	.9423	.3349	.7836
#1	1021.	507500.	975.3	479.7	450.4	955.1	457.5
#2	1044.	516500.	988.3	488.6	457.3	959.9	461.7
#3	1019.	506800.	904.3	478.5	449.6	953.9	454.6
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	1000.	500000.	1000.	500.0	500.0	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	185200.	894.0	917.9	1010.	898.8	979.0	477.5
SDev	1817.	15.9	16.4	21.	8.4	10	3.4
%RSD	.9810	1.790	1.792	2.032	.9370	1.017	.7224
#1	184200.	875.7	922.4	1001.	906.6	973.7	477.0
#2	187300.	905.1	931.7	995.7	889.9	972.8	481.2
#3	184100.	901.1	899.7	1034.	899.8	990.4	474.3
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	200000.	1000.	1000.	1000.	1000.	1000.	500.0
Range	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Analysis Report QC Standard Tue 02-20-96 07:52:30 PM page 1

Method: COE Sample Name: CCV ✓ Operator: PMP
Run Time: 02/20/96 19:50:16
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	499.6	5242.	10150.	5073.	241.4	256.6	504.6
SDev	3.3	39.	93.	64.	2.3	2.2	5.1
%RSD	.6532	.7438	.9174	1.261	.9345	.8496	1.008
#1	496.2	5199.	10050.	5006.	238.9	256.5	498.7
#2	500.0	5252.	10200.	5079.	242.1	258.8	507.0
#3	502.7	5275.	10220.	5134.	243.2	254.5	508.0
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	500.0	5000.	10000.	5000.	250.0	250.0	500.0
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5129.	2016.	2538.	3082.	10100.	9968.	2568.
SDev	42.	18.	24.	45.	97.	35.	22.
%RSD	.8237	.8809	.9421	1.451	.9596	.3491	.8436
#1	5083.	1996.	2514.	3031.	10020.	9973.	2545.
#2	5138.	2026.	2539.	3102.	10080.	10000.	2571.
#3	5167.	2027.	2562.	3114.	10210.	9931.	2588.
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	5000.	2000.	2500.	3000.	10000.	10000.	2500.
Range	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Analysis Report Blank Sample Tue 02-20-96 07:56:02 PM

Method: COE Sample Name: CCB ✓ Operator: PMP
Run Time: 02/20/96 19:53:48
Comment:
Mode: CONC Corr. Factor: 1

Elem	Ag3280	Al3082	As1936	Ba4934	Be3130	Cd2288	Cr2677
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.411	24.51	1.382	.7676	.0227	.7255	1.703
SDev	2.358	17.73	24.10	.5973	.0769	1.123	3.319
%RSD	167.1	72.32	1744.	77.82	339.2	154.7	194.9
#1	4.116	27.12	-20.04	1.112	.0791	1.491	4.339
#2	.3292	40.80	-3.293	1.112	.0538	1.248	2.796
#3	-.2117	5.628	27.47	.0778	-.0649	-.5631	-2.024
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	18.00	111.8	86.59	8.510	.4600	10.08	14.99
Low	-18.00	-111.8	-86.59	-8.510	-.4600	-10.08	-14.99

Elem	Fe2599	Ni2316	Pb2203	Sb2068	Se1960	Tl1908	V-2924
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.712	-8.046	10.21	10.86	-28.74	14.84	3.341
SDev	1.450	5.070	17.82	8.28	17.93	9.70	1.882
%RSD	84.70	63.01	174.4	76.21	62.40	65.41	56.33
#1	3.384	-12.16	24.78	14.04	-11.65	25.89	5.259
#2	.8112	-9.591	15.52	17.09	-27.17	7.705	3.268
#3	.9399	-2.384	-9.651	1.468	-47.41	10.92	1.497
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	14.73	26.04	96.86	81.16	116.5	102.7	12.04
Low	-14.73	-26.04	-96.86	-81.16	-116.5	-102.7	-12.04

STATUS INFORMATION **

Version: 66.0
Date Created: 07/31/91 08:49 Date Last Updated: 02/20/96 06:40

Number of elements: 14 Number of lines: 14

# of lines calibrated: 0
# of lines standardized: 14 02/20/96 06:58 - 02/20/96 07:04

Data collection mode: Spectrum Shifter <4 positions>

Approx. time for analysis 1.8 mins.

Protection status: Un-protected

METHOD INFORMATION **

Sample Introduction Device: Normal
Calibration Mode: Concentration

Default Setup:

Number of Repeats : 3	Auto-store Analysis Data? Yes
Flush Time (sec) : 50.0	Auto-store Stdzn Data? Yes
Auto-Increment Sample Names? No	Store Individual Repeats? Yes
	Auto-print Analysis Data? Yes
	Auto-print Stdzn Report : +Readback
	Condensed Print Format? No

Default File Names:

Analysis Data File : PS0220B	Autosampler Table : COE
	Sample Limits Table : LR846
Calibration Data File : PS0220B	Blank Limits Table : MB846
Calibration Stds Table : PS0220B	QC Check Table : CCV

INTERNAL STANDARDS INFORMATION **

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
1	Time			0	5.0	Yes

Ratio Constant/Intensity Multiplication Factor: .1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
2	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
3	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
4	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
5	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
6	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

#	Elem	Symbol	Wavelength	Pre-integration	Integration	Used?
7	Time			0	5.0	No

Ratio Constant/Intensity Multiplication Factor: 1

OUTPUT INFORMATION **

Output Mode:		Concentration
Override Print Limits?		Yes
Override Significant Figures?		No
Apply Background Correction?		Yes
Apply Blank Subtraction?		No
Limits Table: LR846	Check?	Yes
Correction Factor:		1

Report to:

Screen	Avgs
Printer	Avgs, Stats, Reps, Errs, Units

PLASMA INFORMATION **

Gas Flow Rates

Torch gas flow : High Flow
Auxiliary gas flow: Medium (1.0 L/min)

Peristaltic Pump Parameters

Flush Pump Rate (RPM): 100
Relaxation time (sec): 0
Pump Tubing type : Tygon-Orange

Plasma Parameters

	Group #1	Group #2	Group #3	Group #4	Special Group
Approximate RF Power (W):	1150	1350	950	1750	1150
Analysis Pump Rate (RPM):	100	100	100	100	100
Nebulizer Pressure (PSI):	30	30	30	30	30

Element:	Ag	Al	As	Ba	Be
Wavelength:	328.068	308.215/2	193.696	493.409	313.042
Element Name:	Ag3280	Al3082	As1936	Ba4934	Be3130
Line Switch Conc:	0	0	0	0	0
Peak SS Offset:	0	0	0	0	0
Timing Group No.:	1	1	1	1	1
Print Limit Low:	0	0	0	0	0
Print Limit High:	0	0	0	0	0
Significant Figrs:	4	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	NONE	NONE	NONE	-15
BKG High SS Offset:	15	15	15	15	NONE
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0	S0
Conc/Sig:	0	0	0	0	0
Std #2 (Low) Name:	S1A	S1A	S2A	S1A	S1A
Conc/Sig:	250	2500	5000	2500	125
Std #3 Name:	S1B	S1B	S2B	S1B	S1B
Conc:	500	5000	10000	5000	250
Std #4 Name:	S1	S1	S2	S1	S1
Conc:	1000	10000	20000	10000	500
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Y - intercept:	-2.91611	-34.114	-.173891	.077827	-.633313
Slope:	270.436	753.398	364.384	103.46	7.73898
Date Standardized:	02/20/96	02/20/96	02/20/96	02/20/96	02/20/96
Time Standardized:	18:58	18:58	19:04	18:58	18:58
Offset (A0):	0	0	0	0	0
Gain (A1):	1	1	1	1	1
Curvature (A2):	0	0	0	0	0
Exponent (n):	1	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:					
Use IECs:	YES	YES	YES	NO	YES
Number of IECs:	2	1	3	0	1

Affecting Element:	Fe2599	V-2924	A13082	--n/a--	V-2924
k1 factor:	-.00008	-.03048	.0037	--n/a--	.00286
k2 factor:	0	0	0	--n/a--	0
use?:	YES	YES	YES	--n/a--	YES
Affecting Element:	V-2924	--n/a--	Fe2599	--n/a--	--n/a--
k1 factor:	-.0082	--n/a--	.0001	--n/a--	--n/a--
k2 factor:	0	--n/a--	0	--n/a--	--n/a--
use?:	NO	--n/a--	YES	--n/a--	--n/a--
Affecting Element:	--n/a--	--n/a--	V-2924	--n/a--	--n/a--
k1 factor:	--n/a--	--n/a--	.01617	--n/a--	--n/a--
k2 factor:	--n/a--	--n/a--	0	--n/a--	--n/a--
use?:	--n/a--	--n/a--	YES	--n/a--	--n/a--

Element:	Cd	Cr	Fe	Ni	Pb
Wavelength:	228.802/2	267.716	259.940	231.604/2	220.353
Element Name:	Cd2288	Cr2677	Fe2599	Ni2316	Pb2203
Line Switch Conc:	0	0	0	0	0
Peak SS Offset:	0	0	0	0	0
Timing Group No.:	1	1	1	1	1
Print Limit Low:	0	0	0	0	0
Print Limit High:	0	0	0	0	0
Significant Figrs:	4	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	-15	-15	-15	-15
BKG High SS Offset:	15	NONE	NONE	NONE	NONE
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0	S0
Conc/Sig:	0	0	0	0	0
Std #2 (Low) Name:	S1A	S1A	S1A	S1A	S1A
Conc/Sig:	125	250	2500	1000	1250
Std #3 Name:	S1B	S1B	S1B	S1B	S1B
Conc:	250	500	5000	2000	2500
Std #4 Name:	S1	S1	S1	S1	S1
Conc:	500	1000	10000	4000	5000
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--	--n/a--

Y - intercept:	1.20062	.867927	-.346711	-.581742	-7.12228
Slope:	227.562	96.4082	64.3303	64.3498	420.207
Date Standardized:	02/20/96	02/20/96	02/20/96	02/20/96	02/20/96
Time Standardized:	18:58	18:58	18:58	18:58	18:58
Offset (A0):	0	0	0	0	0
Gain (A1):	1	1	1	1	1
Curvature (A2):	0	0	0	0	0
Exponent (n):	1	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:					
Use IECs:	YES	NO	NO	NO	YES
Number of IECs:	1	0	0	0	1
Affecting Element:	As1936	--n/a--	--n/a--	--n/a--	Al3082
k1 factor:	.0145	--n/a--	--n/a--	--n/a--	.0013
k2 factor:	0	--n/a--	--n/a--	--n/a--	0
use?:	YES	--n/a--	--n/a--	--n/a--	YES

Element:	Sb	Se	Tl	V
Wavelength:	206.838	196.026	190.864/2	292.402
Element Name:	Sb2068	Se1960	Tl1908	V-2924
Line Switch Conc:	0	0	0	0
Peak SS Offset:	0	0	0	0
Timing Group No.:	1	1	1	1
Print Limit Low:	0	0	0	0
Print Limit High:	0	0	0	0
Significant Figrs:	4	4	4	4
Print Units:	ppb	ppb	ppb	ppb
BKG Low SS Offset:	NONE	-15	NONE	NONE
BKG High SS Offset:	15	NONE	15	29
BKG Element Name:	--n/a--	--n/a--	--n/a--	--n/a--
BKG Factor:	--n/a--	--n/a--	--n/a--	--n/a--
Stdz. Method:	Multiple	Multiple	Multiple	Multiple
Std #1 (High) Name:	S0	S0	S0	S0
Conc/Sig:	0	0	0	0
Std #2 (Low) Name:	S1A	S2A	S2A	S1A
Conc/Sig:	1500	5000	5000	1250
Std #3 Name:	S1B	S2B	S2B	S1B
Conc:	3000	10000	10000	2500
Std #4 Name:	S1	S2	S2	S1
Conc:	6000	20000	20000	5000
Std #5 Name:	--n/a--	--n/a--	--n/a--	--n/a--
Conc:	--n/a--	--n/a--	--n/a--	--n/a--
Y - intercept:	12.334	-22.4428	14.1321	4.15295
Slope:	139.403	337.359	267.505	110.652
Date Standardized:	02/20/96	02/20/96	02/20/96	02/20/96
Time Standardized:	18:58	19:04	19:04	18:58
Offset (A0):	0	0	0	0
Gain (A1):	1	1	1	1
Curvature (A2):	0	0	0	0
Exponent (n):	1	1	1	1
Max. Inflection:	NONE	NONE	NONE	NONE
Date of Fit:	NO FIT	NO FIT	NO FIT	NO FIT
Time of Fit:				
Use IECs:	YES	YES	YES	[illegible]
Number of IECs:	3	1	2	[illegible]

Affecting Element:	As1936	Fe2599	Fe2599	Fe2599
k1 factor:	.00008	-.00026	.00133	.000075
k2 factor:	0	0	0	0
use?:	YES	YES	YES	YES

Affecting Element:	V-2924	--n/a--	V-2924	--n/a--
k1 factor:	-.00843	--n/a--	.0018	--n/a--
k2 factor:	0	--n/a--	0	--n/a--
use?:	YES	--n/a--	YES	--n/a--

Affecting Element:	Ni2316	--n/a--	--n/a--	--n/a--
k1 factor:	-.00143	--n/a--	--n/a--	--n/a--
k2 factor:	0	--n/a--	--n/a--	--n/a--
use?:	YES	--n/a--	--n/a--	--n/a--

Mercury

15:31:16 19 Feb 1996

Folder: HG021922
Protocol: HGNORM

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 1 Rep: 1 Seq: 0 15:31:16 19 Feb 1996 HG

Hg .000 ppb -218
Ave. Int. = -218 S. D. = 0

*** Standard: 2 Rep: 1 Seq: 1 15:34:07 19 Feb 1996 HG

Hg .500 ppb 7586
Ave. Int. = 7586 S. D. = 0

*** Standard: 3 Rep: 1 Seq: 2 15:36:58 19 Feb 1996 HG

Hg 1.00 ppb 14950
Ave. Int. = 14950 S. D. = 0

*** Standard: 4 Rep: 1 Seq: 3 15:39:49 19 Feb 1996 HG

Hg 2.00 ppb 32082
Ave. Int. = 32082 S. D. = 0

*** Standard: 5 Rep: 1 Seq: 4 15:42:40 19 Feb 1996 HG

Hg 5.00 ppb 77748
Ave. Int. = 77748 S. D. = 0

*** Standard: 6 Rep: 1 Seq: 5 15:45:32 19 Feb 1996 HG

Hg 10.0 ppb 155985
Ave. Int. = 155985 S. D. = 0

HG021922
HG2.2
2/20/96
KKoerber
960095-CRA, MB1, LC1, LC2
9602L964-004, 005, 008-010,
013-015, 018-021,
023-026

Protocol: HGNORM

Rev: 3.005 Time: 15:45:40 19 Feb 1996

Folder: HG021922 Seq: 6 Print: On

User: KAK Batch: Id: Std6Rep1 Cup: Gas: 0.25 LPM

State: Idle Macro AUTOMOD 79: F3 Print Xmit: Off Autosampler: On

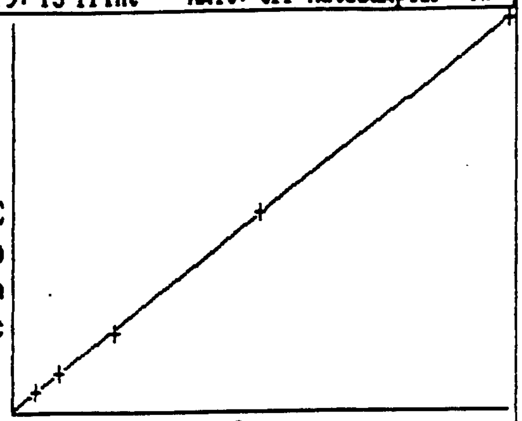
CALIBRATION: Line Calibration

Line: Hg

	Conc.	Calc.	Dev.	Accepted
				LiNear
S1	.000	-.006	-.006	Quadratic
S2	.500	.494	-.006	WtdLinear
S3	1.00	.965	-.035	
S4	2.00	2.06	.063	Accept
S5	5.00	4.99	-.013	
S6	10.0	10.0	-.003	StdAdd

A .0000000 r .999963

B 6.40397e-5 C 0.00691e-3



	Mean	%RSD	
S1	-218	0	-218
S2	7586	0	7586
S3	14958	0	14958
S4	32082	0	32082
S5	77748	0	77748
S6	155985	0	155985

New calibration coefficients stored

```
Line    Conc.   Units      SD/RSD       1          2          3          4          5
----------------------------------------------------------------------------------------
ICV
*** Check Standard: 2  Ck2              Seq:  6          15:48:23 19 Feb 1996 HG
Line  Flag  %Rcv.     Found     True  Units         SD/RSD
Hg          101.      5.05      5.00  ppb            .000
ICB
*** Check Standard: 1  Ck1              Seq:  7          15:51:12 19 Feb 1996 HG
Line  Flag  Found Range(+/-) Units          SD/RSD
Hg          -.002     .200      ppb          .000
CCV
*** Check Standard: 2  Ck2              Seq:  8          15:54:01 19 Feb 1996 HG
Line  Flag  %Rcv.     Found     True  Units         SD/RSD
Hg          101.      5.07      5.00  ppb            .000
CCB
*** Check Standard: 1  Ck1              Seq:  9          15:56:49 19 Feb 1996 HG
Line  Flag  Found Range(+/-) Units          SD/RSD
Hg          .007      .200      ppb          .000

*** Sample ID:                            Seq:  10         15:59:36 19 Feb 1996 HG
                                  96C0095-CRA
Hg     .232      ppb         .000       .232

*** Sample ID:                            Seq:  11         16:02:21 19 Feb 1996 HG
                                  96C0095-MB1
Hg     .011      ppb         .000       .011

*** Sample ID:                            Seq:  12         16:05:06 19 Feb 1996 HG
                                  96C0095-LC1
Hg     4.87      ppb         .000       4.87

*** Sample ID:                            Seq:  13         16:07:52 19 Feb 1996 HG
                                  96C0095-LC2
Hg     4.95      ppb         .000       4.95

*** Sample ID:                            Seq:  14         16:10:38 19 Feb 1996 HG
                                  9602L964-004
Hg     .117      ppb         .000       .117

*** Sample ID:                            Seq:  15         16:13:24 19 Feb 1996 HG
                                  9602L964-005
Hg     .170      ppb         .000       .170

*** Sample ID:                            Seq:  16         16:16:10 19 Feb 1996 HG
                                  9602L964-005R
Hg     .138      ppb         .000       .138

*** Sample ID:                            Seq:  17         16:18:56 19 Feb 1996 HG
                                  9602L964-005S
Hg     1.13      ppb         .000       1.13 -
```

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: Seq: 18 16:21:42 19 Feb 1996 HG
9602L964-005T
Hg 1.14 ppb .000 1.14

*** Sample ID: Seq: 19 16:24:28 19 Feb 1996 HG
9602L964-008
Hg .004 ppb .000 .004

CCV
*** Check Standard: 2 Ck2 Seq: 20 16:27:16 19 Feb 1996 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		100.	5.01	5.00	ppb	.000

CCB
*** Check Standard: 1 Ck1 Seq: 21 16:30:04 19 Feb 1996 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		.011	.200	ppb	.000

*** Sample ID: Seq: 22 16:32:51 19 Feb 1996 HG
9602L964-009
Hg .041 ppb .000 .041

*** Sample ID: Seq: 23 16:35:36 19 Feb 1996 HG
9602L964-010
Hg .047 ppb .000 .047

*** Sample ID: Seq: 24 16:38:20 19 Feb 1996 HG
9602L964-013
Hg .019 ppb .000 .019

*** Sample ID: Seq: 25 16:41:04 19 Feb 1996 HG
9602L964-013R
Hg .020 ppb .000 .020

*** Sample ID: Seq: 26 16:43:48 19 Feb 1996 HG
9602L964-013S
Hg .907 ppb .000 .907

*** Sample ID: Seq: 27 16:46:32 19 Feb 1996 HG
9602L964-013T
Hg .870 ppb .000 .870

*** Sample ID: Seq: 28 16:49:16 19 Feb 1996 HG
9602L964-014
Hg .176 ppb .000 .176

*** Sample ID: Seq: 29 16:52:00 19 Feb 1996 HG
9602L964-014R
Hg .165 ppb .000 .165

```
Line   Conc.  Units     SD/RSD      1        2        3        4        5
---------------------------------------------------------------------------

*** Sample ID:                        Seq:  30     16:54:44 19 Feb 1996 HG
                                9602L964-014S
Hg     1.09    ppb      .000       1.09

*** Sample ID:                        Seq:  31     16:57:28 19 Feb 1996 HG
                                9602L964-014T
Hg     1.08    ppb      .000       1.08
CCV
*** Check Standard: 2  Ck2           Seq:  32     17:00:14 19 Feb 1996 HG
Line  Flag  %Rcv.    Found    True   Units       SD/RSD
Hg          96.5     4.82     5.00   ppb          .000
CCB
*** Check Standard: 1  Ck1           Seq:  33     17:03:03 19 Feb 1996 HG
Line  Flag  Found Range(+/-) Units        SD/RSD
Hg          .009      .200      ppb         .000

*** Sample ID:                        Seq:  34     17:05:49 19 Feb 1996 HG
                                9602L964-015
Hg     .233    ppb      .000       .233

*** Sample ID:                        Seq:  35     17:08:33 19 Feb 1996 HG
                                9602L964-018
Hg     .007    ppb      .000       .007

*** Sample ID:                        Seq:  36     17:11:18 19 Feb 1996 HG
                                9602L964-019
Hg     .066    ppb      .000       .066

*** Sample ID:                        Seq:  37     17:14:00 19 Feb 1996 HG
                                9602L964-020
Hg     .123    ppb      .000       .123

*** Sample ID:                        Seq:  38     17:16:42 19 Feb 1996 HG
                                9602L964-021
Hg     .086    ppb      .000       .086

*** Sample ID:                        Seq:  39     17:19:25 19 Feb 1996 HG
                                9602L964-023
Hg     .074    ppb      .000       .074

*** Sample ID:                        Seq:  40     17:22:08 19 Feb 1996 HG
                                9602L964-024
Hg     .082    ppb      .000       .082

*** Sample ID:                        Seq:  41     17:24:51 19 Feb 1996 HG
                                9602L964-025
Hg     .030    ppb      .000       .030
```

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Sample ID: Seq: 42 17:27:34 19 Feb 1996 HG
9602L964-026

Hg	.054	ppb	.000	.054

CCV
*** Check Standard: 2 Ck2 Seq: 43 17:30:20 19 Feb 1996 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		96.5	4.83	5.00	ppb	.000

CCB
*** Check Standard: 1 Ck1 Seq: 44 17:33:09 19 Feb 1996 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		.007	.200	ppb	.000

Digestion Log

WESTON®

SAMPLE DIGESTION RECORD

Logbook # ~~[illegible]~~ 145

Date/Time Initiated: 2/16/96 13:00
Date/Time Completed: 2/17/96 1900
Analyst: [signature]
Spike Witnessed By: Not available

Digestion Batch #: 96L0322
Type of Prep.ª: ICP
Parameters: Sb, As, Ba, Be, Cd, Cr, Pb, Ni, Se, Ag, Tl
Client: COE-HOT GAS

Matrix (circle): Soil H_2O Other AIR
Relinquished Byᵇ:
Received Byᵇ:
OP / Method #: 21-15-3020.3

Method ~~(circle)~~: CLP SW846 Other

RFW #	Spike Info.	Intitial WT/Vol.	Final Vol.	%Solids	pH<2	Total/ Soluble	Texture	~~Color/Appearance~~	Artifacts	Turbidity
9602L964-								C/D FACTOR	JW. 2/17/96	
008			100 ml		✓	TOTAL		0.1333		
013			↓		✓	↓		0.1103		
018			↓		✓	↓		0.1093		
021			↓		✓	↓		0.1246		
023			150 ml		✓	↓		0.1500		
024			↓		✓	↓		0.1500		
025			↓		✓	↓		0.1500		
026			↓		✓	↓		0.1500		
96L0322-										
MB1			100 ml							
LC1	1 ml ICPICV 1-4		↓							
LC2	↓		↓							

See also book #4493 pages 34-35 (Multi-metals digestion log)

Jeffrey Welch 2/17/96

Reagent/Standard & Lot Expiration & Preparation Information on Page 001

IC032281 4 Pr [illegible]

Reviewed By/Date [signature] 2/20/96

ª for SW-846 ICP/FLAA batches, specify method 3005 or 3010
ᵇ include date/time of transfer

RFW 21-21-018/B-08/95

WESTON®

MERCURY PREPARATION

Logbook # 5314

Analyst: KKoulen
Date: 2/19/96
Start Time/Temp: 1330/90°C
End Time/Temp: 1530/90°C
pH < 2 for Liquids? ✓ Yes ___ No

Instrument ID: HG2.2
Balance #: NA

Prep Batch: 96C0095
Worksheet: HG021922
OP: 21-15-0245.1 Rev. 07

(If no; designate affected samples in Comments column, and initiate an SDR)

RFW #	Container Number	Spike Info.	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
blank	Z		33ml	33ml	
0.5ug/L	200				Air
1.0ug/L	2028				Samples
2.0ug/L	D6				
5.0ug/L	7G				
10.0ug/L	1208				
ICV/CCV	60	5.0ug/L			
ICB/CCB	140				
CRA	15	0.2ug/L			
MB1	X9				PBW95
LC1	0111	5.0ug/L			LCSW95
LC2	6C				LCSW295
9602L964-004	16X		11ml		KMnO4
-005	1102		33ml		HCl
-005R	24				
-005S	125	1.0ug/L			
-005T	69				
-008	2045		3.33ml		H_2O_2
-009	A7		11ml		KMnO4
-010	B2		33ml		HCl
-013	39P		3.33ml		H_2O_2
-013R	1101				
-013S	12	1.0ug/L			

continued in book #5363

Standard:	ID	Prep Date/Time	Expir Date
ICAL/MS	High Purity	2/19/96/0953	12/96
ICV/CCV/LCS	Inorganic Ventures	2/19/96/0955	11/14/96

(Soil LCS = Buffalo River Sediment)

Reviewed By/Date: M. Doughty 2/19/96

RFW 21-21L-018/H-12/95

WESTON®

MERCURY PREPARATION

Logbook # 5363

Analyst: KKoeuler
Date: 2/19/96
Start Time/Temp: 1330/90°C
End Time/Temp: 1530/90°C
pH < 2 for Liquids? ✓ Yes __ No

Instrument ID: HG2.2
Balance #: (NA)

Prep Batch: 96C0095
Worksheet: HG021922
OP: 21-15-0245.1 Rev. 07

(If no; designate affected samples in Comments column, and initiate an SDR)

RFW #	Container Number	Spike Info	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
9602L944-013T	V	1.0ug/L	3.33ml	33ml	H_2O_2
-014	4X		11ml		$KMnO_4$
-014R	7G				
-014S	R	1.0ug/L			
-014T	1109				
-015	7Q		33ml		HCl
-018	165		3.33ml		H_2O_2
-019	201		11ml		$KMnO_4$
-020	OK		33ml		HCl
-021	BG		3.33ml		H_2O_2
-023	4K		33ml		Comp
-024	1025				
-025	H				
-026	3X				

KKoeuler 2/19/96

Standard:	ID	Prep Date/Time	Expir Date
ICAL/MS	High Purity	2/19/96/0955	12/96
ICV/CCV/LCS	Inorganic Ventures	2/19/96/0955	11/14/96

Reviewed By/Date: M Dougherty 2/19/96

(Soil LCS = Buffalo River Sediment)

RFW 21-21L-018/H-12/95

WESTON®

MULTI-METALS DIGESTION LOG
(AIR: Stationary Source Metals)

Analyst: J. Welch

Date/Time: 2/16/96 13:50

RFW Number: 9602L964

Run Number: Run 1

Notebook # 4493

Page # 31

FRONT HALF (Fraction I) Composite Sample # 023

Sample # 002 Sample # N/A Sample # 001

Filter 0.425 g Acetone N/A mL Nitric Rinse 111 mL

_____ g Particulates? Y / N C/D FACTOR = 0.1500 (METALS + Hg)

_____ g

Final Volume Fraction I 150 mL (combined digestate)

Fraction Ia 100 mL (metals) FILTER IN BOMB # 4782-5

Fraction Ib 50 mL (mercury)

BACK HALF NITRIC (Fraction II) Sample # ~~004~~ 003 JW 2/16/96

Volume Received ~~N.J.~~ mL

Fraction IIa JW 2/16/96 mL (metals) Sample rec'd broken per log-in

Fraction IIb _____ mL (mercury)

BACK HALF $KMnO_4$ (Fraction III) Sample # 004

Volume Received 257 mL C/D = 0.2570

Fraction III 257 mL (mercury)

BH HCl SAMPLE # 005

VOL. REC'D 316 mL

C/D = 0.3160

COMMENTS:

005 (B.H. #4) is brownish purple. Could be $KMnO_4$.

Completed by: Jeffrey Welch

Date/Time: 2/17/96 1900

Reviewed By: [signature]

Date: 2/22/96

RFW 21-21-018/G-02/92

WESTON®

MULTI-METALS DIGESTION LOG
(AIR: Stationary Source Metals)

Analyst: JWelch

Date/Time: 2/16/96 13:00

RFW Number: 9602L964

Run Number: Site Blanks (S.B.)

Notebook # 4493

Page # 35

FRONT HALF (Fraction I) Composite Sample # 024

Sample # 007 Sample # N/A Sample # 006

Filter 0.389 g Acetone N/A mL Nitric Rinse 201 mL

_____ g. Particulates? Y / N c/0 FACTOR = 0.1500 (METALS + Hg)

_____ g FILTER IN BOMB # 4782-6

Final Volume Fraction I 150 mL (combined digestate)

Fraction Ia 100 mL (metals)

Fraction Ib 50 mL (mercury)

BACK HALF NITRIC (Fraction II) Sample # 008

Volume Received 200ml mL c/0 = 0.1333 (metals)

Fraction IIa 150 mL (metals) 0.2000 (Hg)

Fraction IIb 50 mL (mercury) 100mls final volume (ICP)

BACK HALF $KMnO_4$ (Fraction III) Sample # 009

Volume Received 220 mL c/0 = 0.2200

Fraction III 220 mL (mercury)

B.H. HCl SAMPLE # 010

VOL. REC'D 224 ml

c/0 = 0.2240

COMMENTS:

Completed by: J. Jeffrey Welch

Date/Time: 2/17/96 1900

Reviewed By: [illegible]

Date: 2/22/96

RFW 21-21-018/G-02/92

WESTON®

MULTI-METALS DIGESTION LOG
(AIR: Stationary Source Metals)

Analyst: JWelch

Date/Time: 2/16/96 13:00

RFW Number: 9602L964

Run Number: Run 2

Notebook # 4493

Page # 36

FRONT HALF (Fraction I) Composite Sample # 025

Sample # 012 Sample # N/A Sample # 011

Filter 0.405 g Acetone N/A mL Nitric Rinse 151 mL

_____ g Particulates? Y / N c/d = 0.1500 (metals + Hg)

_____ g FILTER IN BOMB WP# 4782-7

Final Volume Fraction I 150 mL (combined digestate)

Fraction Ia 150 mL (metals)

Fraction Ib 50 mL (mercury)

BACK HALF NITRIC (Fraction II) Sample # 013

Volume Received 538 mL c/d = 0.1103 (metals)

Fraction IIa 488 mL (metals) 0.5380 (Hg)

Fraction IIb 50 mL (mercury) 100mls final volume (ILP)

BACK HALF $KMnO_4$ (Fraction III) Sample # 014

Volume Received 390 mL c/d = 0.3900

Fraction III 390 mL (mercury)

B.H. HCl SAMPLE # 015

VOL. REC'D 226 ml

c/d = 0.2260

COMMENTS:

B.H. HCl is brown. Could be $KMnO_4$

Completed by: J. Jeffrey Welch

Date/Time: 2/17/96 1900

Reviewed By: [signature]

Date: 2/22/96

RFW 21-21-018/G-02/92

WESTON®

MULTI-METALS DIGESTION LOG
(AIR: Stationary Source Metals)

Analyst: JWelsh

Date/Time: 2/16/96 1300

RFW Number: 9602L964

Run Number: Run 3

Notebook # 4493

Page # 37

FRONT HALF (Fraction I) Composite Sample # 026

Sample # 017 Sample # N/A Sample # 016

Filter 0.406 g Acetone N/A mL Nitric Rinse 156 mL

_____ g Particulates? Y / N c/D = 0.1500 (metals + Hg)

_____ g FILTER IN BOMB CUP # 4782-8

Final Volume Fraction I 150 mL (combined digestate)

Fraction Ia 100 mL (metals)

Fraction Ib 50 mL (mercury)

BACK HALF NITRIC (Fraction II) Sample # ~~016~~ 018 JW. 2/16/96

Volume Received 589 mL C/D: 0.1093 (metals)

Fraction IIa 539 mL (metals) 0.5890 (Hg)

Fraction IIb 50 mL (mercury) 100ml final volume (ICP)

BACK HALF $KMnO_4$ (Fraction III) Sample # 019 | B.H. HCl SAMPLE # 020

Volume Received 396 mL c/D = 0.3960 | VOL. REC'D ~~0~~229 ml JW. (229ml) 2/17/96

Fraction III 396 mL (mercury) | C/D = 0.2290

COMMENTS:

018, 016 - no teflon tape around bottle lid (017, ~~045~~ 019, + 020 too) JW. 2/22/96

B.H. HCl is brown. Could be $KMnO_4$

Completed by: J. Jeffrey Welsh

Date/Time: 2/17/96 1900

Reviewed By: WPB

Date: 2/27/96

RFW 21-21-018/G-02/92

WESTON®

MULTI-METALS DIGESTION LOG
(AIR: Stationary Source Metals)

Analyst: JWelch

Date/Time: 2/16/96 13:00

RFW Number: 9602L964

Run Number: PTR-A

Notebook # 4493

Page # 38

~~FRONT HALF (Fraction I)~~ Composite Sample # ______

Sample # ______ Sample # ______ Sample # ______

Filter ______ g Acetone ______ mL Nitric Rinse ______ mL

______ g Particulates? Y / N N/A JW. 2/16/96

______ g

Final Volume Fraction I ______ mL (combined digestate)

Fraction Ia ______ mL (metals)

Fraction Ib ______ mL (mercury)

BACK HALF NITRIC (Fraction II) Sample # 021

Volume Received 253 mL C/D= 0.1246 (metals)

Fraction IIa 203 mL (metals) 0.7530 (Hg)

Fraction IIb 50 mL (mercury) 100 ml final volume (Icd)

~~BACK HALF KMnO$_4$ (Fraction III)~~ Sample # ______

Volume Received ______ mL N/A JW 2/16/96

Fraction III ______ mL (mercury)

COMMENTS:

Completed by: J. Jeffrey Welch

Date/Time: 2/17/96 1900

Reviewed By: [signature]

Date: 2/22/96

RFW 21-21-018/G-02/92

WESTON® **ICP RUN LOG** LOGBOOK # 5340

PAGE # 6

DATE: 02/19/96 STANDARD: H.P. I.V. PEAK PROFILE: 10036975

ANALYST: MAS PREPARER: MAS SPECTRAL SHIFT: 579

INSTRUMENT ID: IC3 TIME PREPARED 10:30 UNITS: ______ @ TIME: 12:00

DATA FILE	DIGEST BATCH	CLIENT	RFW NUMBER	# OF SPLS	METH FILE	FILE TRANS. TO LIMS	REPRO-FILE (Y/N)	COMMENTS
PS0219A	96L0308	Bechtel	96021024	0045	Cu	PS1.PRN (IC3, 1)	(Y)	NO Rerun
						updated MAS 2/19/96		
PS0219B	96L0322	COE-HOT GAS	96021964	3QC 008,013 018,021	COE	PS2.PRN (IC3.2)	(Y)	NO Rerun
				025 026		updated	MAS 2-20-96	
PS0219C	96L0334	Sherwin Williams	96021126	3QC 014	Pb	PS3.PRN (IC3.3)	(Y)	NO Rerun
	96L0333		96021126	3QC 001		updated		
				013,L, 015 016	R,S	MAS 2/20/96		
PS0219D	96L0327	PADER	96021976	3QC 001,L R,S 003,008	Zn	PS4.PRN (IC3.4)	(Y)	NO Rerun
			96021992	003 005 011		updated	PMP 2-20-96	

Bhadel 02-19-96

RFW 21-21-020/D-01/92

REVIEWED BY/DATE [signature] 2/20/96

WESTON® ICP RUN LOG 4

LOGBOOK # 5340
PAGE # 7

DATE: 02/20/96 STANDARD: H.P. / I.V. PEAK PROFILE: -0.0128
ANALYST: PMP PREPARER: MAR SPECTRAL SHIFT: 584
INSTRUMENT ID: IC3 TIME PREPARED 17:00 UNITS: ______ @ TIME: 00:15A

DATA FILE	DIGEST BATCH	CLIENT	RFW NUMBER	# OF SPLS	METH FILE	FILE TRANS. TO LIMS	REPRO-FILE (Y/N)	COMMENTS
PS0220A	96L0326	TRC	9602L955	3QC 003,L R,S	Zn	PSA.PRN (IC3.1)	(Y)	NO Rerun
				005 014,L,R,S 016		~~Updated~~ ~~Retrieved~~	PMP 2-20-96 2/20/96	
PS0220B	96L0322	COE-HOT Gas	9602L964	023 024	COE	PSB.PRN (IC3.2)	(Y)	No Rerun
						~~Retrieved~~ ~~Updated~~	PMP 02-20-96	
PS0220C	96L0328	USACE Norris	9602L890	3QC 002 006	Zn	PSC.PRN (IC3.3)	(Y)	No Rerun
						~~Retrieved~~ ~~Updated~~	PMP 2-20-96	
PS0220D	96L0346	Sherwin Williams	9602L133	3QC 021	Pb	PSD.PRN (IC3.4)	(Y)	NO Rerun
	96L0345	↓	9602L133	3QC 001 ↓ 016,L,R,S ↓ 020				

PMP 02-20-96

RFW 21-21-020/D-01/92

REVIEWED BY/DATE MD 2/21/96

[redacted]

WESTON®

STANDARDS PREPARATION: DAILY ICP SOLUTIONS

STD 1 (H.P. Lot# 591009)	STD 1 (H.P. Lot# 5910)	STD 2 (H.P. Lot# 5910)	STD 4 (H.P. Lot# 10 4910)	STD 4	STD 5	ICV (Lot# K-ME849058)	ICV (Lot# K-ME849058)	ICV (Lot# K-ME849060)	Lot# K-ME849061
~~ICALS~~	~~XWES1~~	~~XWES2~~	~~XWES3~~	SE	LI	~~XWES1A~~	~~XWES2A~~	~~XWES3A~~	~~Sb~~
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	Lot 591314 H.P. ✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	Lot 591314 H.P. ✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	N/A	N/A	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓
✓	✓	✓	✓	n/a	n/a	✓	✓	✓	✓

Reviewed by/Date ______________

RFW # 21-21-008/I-03/92

PAGE # A

0 047

WESTON®

STANDARD PREPARATION: DAILY ICP SOLUTIONS

ICV		ISB (J.V. Lot# K-ME845088)	ISB (Lot# J-ME80250G)	ISA	CRI	INIT	DATE	TIME	COMMENTS
SE	LI	ICSA	ICSB	ICSA					
n/a	n/a	n/a	n/a	n/a	✓	MAB	1/30/96	12:00	
n/a	n/a	n/a	n/a	n/a	n/a	[illegible]	1/29/96	11:00	N/A matrix match
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	1/29/96	17:00	
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	1/30/96	15:30	
n/a	n/a	n/a	n/a	n/a	✓	MAL	1/31/96	10:30	matrix match for PE
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	1/31/96	14:30	
N/A	N/A	N/A	N/A	N/A	✓	PMP	2/1/96	12:15 P.M.	
N/A	N/A	✓	✓	✓	✓	PMP	2/2/96	1:30 P.M.	
n/a	n/a	✓	✓	n/a	✓	MAL	2/3/96	20:00	
n/a	n/a	✓	✓	Lot# K-MEB25088 ✓	✓	MAL	2/4/96	14:00	① ②
n/a	n/a	✓	✓	✓	✓	[illegible]	2/8/96	13:00	
N/A	N/A				✓	PMP	2/9/96	14:45	
n/a	n/a	✓	✓	✓	✓	[illegible]	2/4/96	12:00	
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	2/4/96	10:00	
N/A	N/A	N/A	N/A	N/A	✓	PMP	2/12/96	3:00 P.M	
n/a	n/a	✓	✓	✓	✓	[illegible]	2/13/96	12:30	
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	2/14/96	09:30	
n/a	n/a	n/a	n/a	n/a	✓	[illegible]	2/15/96	8:00	
N/A	N/A	✓	✓	✓	✓	PMP	2/16/96	19:00	
n/a	n/a	n/c	n/c	n/a	✓	[illegible]	2/17/96	11:30	
N/A	N/A	✓	✓	✓	✓	PMP	2/18/96	12:00 P.M.	
n/a	n/a	✓	✓	✓	✓	[illegible]	2/19/96	10:30	
n/a	n/a	n/a	n/a	n/a	✓	MAL	2/20/96	17:00	

① P-added H.P. 410411 52
② P-added J.V. K-P01079 ICV

Reviewedby/Date ______________

RFW # 21-21-008/I-03/92

PAGE # B

047

End of Data Package

HEXAVALENT CHROMIUM

RESEARCH TRIANGLE INSTITUTE

/RTI

Center for Environmental Measurements and Quality Assurance

February 21, 1996

Mr. Jeffrey D. O'Neill
Roy F. Weston Inc.
1 Weston Way
West Chester, PA 19380

Dear Jeffrey,

Enclosed are the Cr(VI) analysis results as determined by ion chromatography using ultratrace mode for the impinger samples received on February 6, 1996 for RTI Project No. 91C-4848-02Q, Roy F. Weston WO# 02281-012-012-1200.

If you have any questions, please call me at 919-541-6569 or Peter Grohse at 919-541-6897.

Sincerely,

Kate Luk

Kate K. Luk, Ph.D.

kkl

Ref: 91C-4848-02Q
cc: W. Gutknecht
P. Grohse
C. Decker
N. Singleton

3040 Cornwallis Road • Post Office Box 12194 • Research Triangle Park, North Carolina 27709-2194 USA
Telephone 919 541-6503 • Fax 919 541-7386

TECHNICAL REPORT

Client: Roy F. Weston Inc.

***Purchase Order No.*:** Work Order No. 02281-012-012-1200

RTI Project No.: 91C-4848-02Q

Date: February 21, 1996

By

Kate K. Luk

Submitted to:

Mr. Jeffrey D. O'Neill
Roy F. Weston Inc.
1 Weston Way
West Chester, PA 19380

INTRODUCTION

Five impinger samples were received under Work Order No. 002281-012-012-1200 on February 6, 1996 for ultratrace hexavalent chromium analysis.

ANALYSIS

The samples were analyzed as follows:

Digestion Method - N/A

Instrumentation - Dionex IC

Measurement Method - IC/PCR

QA/QC - Duplicates, spikes, blanks, calibration check solutions were used

RESULTS

See Tables No. 1, 2, and 3.

COMMENTS: No problems encountered.

SAMPLE CUSTODY: Samples will be kept for 3 months after report is delivered.

RTI Project No.: 4848-02Q

Samples: Impinger Samples
Company: Roy F. Weston (WO# 02281-012-012-1200)
Analyte: Cr(VI)
Method of Analysis: Ion Chromatography / Post Column Reaction
Sample Received Date: 2-6-96
Report Date: 2-21-96

Table 1. Results for Cr(VI) Samples

Sample	Total Volume L	Cr(VI) ug/L	Total Cr(VI) ug
COE-HG-AFT-OUT-CR6-R1-KOH	0.989	62.0	61.3
COE-HG-AFT-OUT-CR6-R2-KOH	0.940	67.5	63.5
COE-HG-AFT-OUT-CR6-R3-KOH	1.006	47.5	47.8
COE-HG-OUT-CR6-SB-H2O	0.284	< 0.15	< 0.043
COE-HG-OUT-CR6-SB-KOH	0.292	2.40	0.701
Detection Limit		0.15	

Note:

Total Cr(VI), ug = Cr(VI), ug/L x Total volume, L

RTI Project No.: 4848-02Q

Samples: QC for Impinger Samples
Company: Roy F. Weston (WO# 02281-012-012-1200)
Analyte: Cr(VI)
Method of Analysis: Ion Chromatography / Post Column Reaction
Sample Received Date: 2-6-96
Report Date: 2-21-96

Table 2. Calibration Check Sample

Sample	Cr(VI) ug/L Measured	Cr(VI) ug/L Expected
QC	2.08	2.00
QC	2.01	2.00

Table 3. Results of Blank, Duplicate, and Spike Analysis

Sample	Cr(VI) ug/L Measured	Cr(VI) Spike ug/L Measured	Cr(VI) Spike ug/L Expected	Cr(VI) Spike Recovery,%
RTI-DIW	< 0.15	--	--	--
COE-HG-CR6-R1-KOH DUP	63.2	--	--	--
COE-HG-CR6-R3-KOH SPK	--	2.29	2.50	91.6

COE-HG-CR6-R1-KOH = COE-HG-AFT-OUT-CR6-R1-KOH
COE-HG-CR6-R3-KOH = COE-HG-AFT-OUT-CR6-R3-KOH

EXPLOSIVES

EXPLOSIVES: COMPLETE SDG FILE (CSF) INVENTORY SHEET

LABORATORY NAME:	Roy F. Weston, Inc., Analytics Division
CITY/STATE:	Lionville, PA
CASE/SDG NO.:	9602L916
CLIENT NAME:	COE-AAAR HOT GAS
WORK ORDER NO.:	02281-012-012-1200
METHOD BASED ON:	SW8330 -Explosives By HPLC

All documents in the Client's copy of the complete SDG file must be legible, clearly labeled, paginated, single-sided original documents; or of sufficient copy quality to be reproducible to fourth generation copies. (Purge file documents, e.g., original-copy chain-of-custody, etc. assembled per specific contract request only.)

	CLIENT: SDG No.:	Page Nos From	To	Check (initials/date) Lab	Client
1	Cover Page (Lab Chron)	1	2	[illegible] 2-20-96	
2	Table of Contents	3	3		
3	Case Narrative	4	8		
4	Shipping, Receiving, and Custody Records	9	12		
	• Lab Chain of Custody/Work Request			[illegible] 2-20-96	
	• Client Custody Reports/Packing Lists			[illegible] NA	
	• Sample Tags, if applicable				
	• Airbills			2-20-96	
5	Explosives Sample Data/QC Summary	13	22		
	• Data Summary (LIMS Summary Report)			2/20/96	
	• Surrogate %Recovery Summary (Form II)			2/20/96	
	• MS/MSD Summary (Form III)			NA	
	• BS/BSD Summary (Form III)			2/20/96	
	• Method Blank Summary (Form IV)			2/20/96	
6	Sample Data, for each Sample:	23	96		
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, Primary column			2/20/96	
	• Chromatograms/Quant Reports, Confirmation column			2/20/96	
7	Calibration Standard Data	97	177		
	Primary Column Standards Data	98			
	• Initial Multi-Range Calibration: Chromatograms/Quant Reports			2/20/96	
	• Daily Calibration:				
	Initial: Chromatograms/Quant Reports			2/20/96	
	Continuing: Chromatograms/Quant Reports			2/20/96	
	Confirmation Column Standards Data		177		
	• Initial Multi-Range Calibration: Chromatograms/Quant Reports			2/20/96	
	• Daily Calibration:				

CLIENT: COE-Hot GAS
SDG No.: 9602L916

		Page Nos From	Page Nos To	Check (initials/date) Lab	Check (initials/date) Client
	Initial: Chromatograms/Quant Reports			2/20/96	
	Continuing: Chromatograms/Quant Reports			2/20/96	
8	Raw QC Data: Blank and Matrix Spike Data	178	196		
	Method Blank Data	179	196		
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, primary column			2/20/96	
	• Chromatograms/Quant Reports, confirmation column			N/A	
	Blank Spike/Blank Spike Duplicate				
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, primary column			2/20/96	
	Matrix Spike/Matrix Spike Duplicate	NA	—		
	• Explosive Results (Form I)			N/A	
	• Chromatograms/Quant Reports, primary column				
9	Analysis Logbook Pages	197	208	2/20/96	
10	Standards Preparation Records	209	216		
	• Surrogate and Target Analyte Spike Solutions			2/20/96	
	• Analysis Standards			2/20/96	
11	Preparation Logs	217	223		
	• Sample Prep (Extraction) Records			2/20/96	
12	Other/Miscellaneous	224	(NA)		
				022096	

COMMENTS:

Checked by: (Laboratory) Signature: [signature] Printed Name/Title: Janice Driscoll Data Report Coordinator Date: 2-20-96

Checked by: (Client) Signature Printed Name/Title Date

Cover Page (Lab Chron)

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/02/96 RFW LOT # :9602L916

CLIENT ID	RFW #		MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-EXP/SV-R1-CND	004		AI	96LLC013	01/31/96	02/07/96	02/08/96
IN/OUT-EXP/SV-SB-ACE	006		AI	96LLC017	01/31/96	02/08/96	02/09/96
IN/OUT-EXP/SV-SB-CND	009		AI	96LLC013	01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1-CND	013		AI	96LLC013	01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1-CND	013	01	AI		01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1MS-CND	018		AI	96LLC013	02/01/96	02/07/96	02/08/96
AFTIN-EXP-R1MS-CND	018	01	AI		02/01/96	02/07/96	02/08/96
AFTOUT-EXP/SV-R1-FB	020		AI	96LLC017	01/31/96	02/08/96	02/08/96
AFTOUT-EXP/SV-R1-FX	021		AI	96LLC014	01/31/96	02/07/96	02/08/96
IN/OUT-EXP/SV-SB-FX	022		AI	96LLC014	01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1-FB	023		AI	96LLC017	01/31/96	02/08/96	02/09/96
AFTIN-EXP-R1-FB	023	01	AI		01/31/96	02/08/96	02/08/96
AFTIN-EXP-R1-FX	024		AI	96LLC014	01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1-FX	024	01	AI		01/31/96	02/07/96	02/08/96
AFTIN-EXP-R1MS-FB	025		AI	96LLC017	02/01/96	02/08/96	02/09/96
AFTIN-EXP-R1MS-FX	026		AI	96LLC014	02/01/96	02/07/96	02/08/96
AFTIN-EXP-R1MS-FX	026	01	AI		02/01/96	02/07/96	02/10/96

LAB QC:

BLK	MB1	AI	96LLC013	N/A	02/07/96	02/08/96
BLK	MB1 BS	AI	96LLC013	N/A	02/07/96	02/08/96
BLK	MB1	AI	96LLC017	N/A	02/08/96	02/09/96
BLK	MB1 BS	AI	96LLC017	N/A	02/08/96	02/09/96
BLK	MB1	AI	96LLC014	N/A	02/07/96	02/08/96
BLK	MB1 BS	AI	96LLC014	N/A	02/07/96	02/08/96

WESTON

TABLE OF CONTENTS

EXPLOSIVES

Case Narrative

WESTON

LIONVILLE LABORATORY
ANALYTICAL REPORT

Client : COE-HOT GAS
RFW# : 9602L916

W.O :02281-012-012-1200-00
Date Received: 02 February 1996

EXPLOSIVE

1. The set of samples consisted of four (4) air samples collected on 31 January 1996 and 01 February 1996. Each sampling train consisted of three fractions: condensate, solid (filter / XAD), and solvent; each fraction was analyzed and reported individually.

2. The samples and their associated QC samples were prepared on 07,08 February 1996 and analyzed by methodology based on EPA method 8330 on 08,09,10 February 1996.

3. The sample ID's for this set of samples were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters on Organic CLP forms.

4. All required holding times for extraction and analysis were met.

5. All initial calibrations associated with this data set were within acceptance criteria.

6. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

7. Laboratory control limits were not available for assessing surrogate and spike recoveries for the procedures used to prepare these samples.

8. Tetryl was not recovered from the blank spike (96LLC017-MB1 BS) associated with the solvent matrix.

9. All samples associated with 'AFTIN' (afterburner inlet) required dilution due to the presence of high levels of target analytes.

10. Relatively low 1,3,5-Trinitrobenzene and Tetryl recoveries were observed for the blank spike (96LLC014-MB1 BS) associated with the solid matrix.

11. The follwoing solvent samples required two-fold dilutions due to immiscibility with acetonitrile:

1. IN/OUT-EXP/SV-SB-ACE
2. AFTIN-EXP-R1MS-FB
3. 96LLC017-MB1
4. 96LLC017-MB1 BS

Bruce C. Miller, unit leader

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-21-96
Date

cs/jkd/misc/02-916.ex

WESTON

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Initiator: K. Baker RFW Batch: 9602L916, 943 Parameter: All
Date: 2-14-96 Samples: All Matrix: Air
Client: AAAP Hot Gas Method: SW846/MCAWW/CLP Prep Batch:

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error
__ Transcription Error
__ Client Request
__ Wrong Test Code
__ Sampler Error on C-O-C
X Other Wrong Matrix

b. General Discrepancy
__ Missing Sample/Extract*
__ Hold Time Exceeded
__ Improper Bottle Type
__ Container Broken*
__ Insufficient Sample*
__ Not Amenable to Analysis
__ Wrong Sample Pulled
__ Preservation Wrong
__ Label ID's Illegible
__ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ____________

c. QC Problem (Include all relevant specific results; attach data if necessary)

ALL matrices should be air.
please change all samples listed as water to air.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action
__ Re-log
 __ Entire Batch
 __ Following Samples: ____________
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ____________
__ Place On/Take Off Hold (circle)

Other Description:
X change matrix where appropriate to air.

4. Project Manager Instructions...signature/date: K Baker 2/14/96
X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
 Date/Person ____________
__ Add
__ Cancel

5. Final Action...signature/date: [signature] 2/15/96 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr:	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ____________

RFW 21-21-006/E-03/95

WESTON

Shipping, Receiving, and Custody Record

RFW

Explosives - AFT OUTLET

WESTON Analytics Use Only: 9602L916

Custody Transfer Record/Lab Work Request

WESTON

Client: COE - HOT GAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill X7201
AD Project Manager: K. Baker
QC: SDD TAT: 14 DAY
Date Rec'd: 2/2/96 Date Due: 2/16/96
Account #: COEHOTGAS

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb | INORG: Metal, CN

All samples

WESTON Analytics Use Only: EXPLOSIVES EPA 8330 | Semi-Volatiles EPA 8270

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330			Semi-Volatiles EPA 8270	
001	COE-HG-AFTOUT-EXP/SV-R1-FH			Air	1/31/96		X			X	Run One
002	COE-HG-AFTOUT-EXP/SV-R1-FLT						X			X	
003	COE-HG-AFTOUT-EXP/SV-R1-XAD						X			X	
004	COE-HG-AFTOUT-EXP/SV-R1-COND						X	✓	✓	X	
005	COE-HG-AFTOUT-EXP/SV-R1-BH			Air			X			X	
006	COE-HG-IN/OUT-EXP/SV-SB-AE/RM			Air	1/31/96		X	✓		X	Site Blanks
007	COE-HG-IN/OUT-EXP/SV-SB-FLT			Air			X			X	
008	COE-HG-IN/OUT-EXP/SV-SB-XAD						X			X	
009	COE-HG-IN/OUT-EXP/SV-SB-H2O						X	✓		X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
*RDX; HMX; Tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT

no filter #'s given

DATE/REVISIONS:
1. Analyze 1 run of
2. the Exp/SV for
3. lower carbon number
4. semi-volatiles using
5. EPA 8015. Select run
6. with highest explosives

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	[signature]	2/2/96	1:55 PM				

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

WESTON Analytics Use Only
Samples were: 1) Shipped X or Hand Delivered; Airbill # see page 3
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N

See page #3 for revisions

COE HG truncated from ID to accommodate form

010

WESTON Analytics Use Only
9602L916

KPW
Explosives - AFT. INLET

Custody Transfer Record/Lab Work Request

WESTON

Client COE HOTGAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # J. O'Neill X7201
AD Project Manager K. Baker
QC SDD Date Due/TAT 14 day
Date Rec'd 2/2/96 Date Due 2/16/96
Account # COE HOTGAS

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →

ORGANIC: VOA, BNA, Pest/PCB, Herb, 8330
INORG: Metal, CN

WESTON Analytics Use Only: EXPLOSIVES EPA 8330*; Semi vol. 8015**

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix	Date Collected	Time Collected	Pest/PCB (EPA 8330)				Metal	
010	COE-HG-AFTIN-EXP-RI-FHS	Air	1/31/96		X				X	NO
011	COE-HG-AFTIN-EXP-RI-FLT				X				X	NO
012	COE-HG-AFTIN-EXP-RI-XAD				X					Run One
013	COE-HG-AFTIN-EXP-RI-COND	Air			X	✓	✓	✓		
014	COE-HG-AFTIN-EXP-RI-BHS	Air			X					
015	COE-HG-AFTIN-EXP-RIMS	AU	1/31/96 2/1/96		X					
016	COE-HG-AFTIN-EXP-RIMS	FILT		300	X					Run One MID SOAK
017	COE-HG-AFTIN-EXP-RIMS	XAD			X					
018	COE-HG-AFTIN-EXP-RIMS	COND			X	✓	✓			
019	COE-HG-AFTIN-EXP-RIMS	BHS			X					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
* RDX; HMX; Tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT
** Analyze 1 of 3 1st runs for semivolatiles only EPA 8015 - select run based on highest 8330 values.

DATE/REVISIONS:
1. Note RI INLET SAMPLES
2. MAY BE have elevated
3. concentration - XAD and
4. condensate - yellow
5. lower carbon number
6. select run based on highest 8330 values

Relinquished by	Received by	Date	Time
[signature]	[signature]	2/2/96	1:00

Relinquished by	Received by	Date	Time

WESTON Analytics Use Only
Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 998523477
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RPW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

8°, 5°, 6.5°, 11.6°, 7.4°, 4.2°

WESTON Analytics Use Only

9602L916

Custody Transfer Record/Lab Work Request

WESTON

Page 3 of 3

012

Client COE HOT GAS
Est. Final Proj. Sampling Date
Work Order #
Project Contact/Phone # Jay Pay
AD Project Manager
QC ______ Del ______ TAT ______
Date Rec'd ______ Date Due ______
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	0625A	DRO		08330	
020	AFTOUT-EXP/SV-RI-FB			Air	1/31/96		✓	✓		✓	Compos. 001 + 005
21	AFTOUT-EXP/SV-RI-FX						✓	✓		✓	002 + 003
22	IN/OUT-EXP/SV-SBFX						✓			✓	007 + 008
23	AFTIN-EXP-RI-FB						✓	✓		✓	010 + 014
24	AFTIN-EXP-RI-FX						✓	✓		✓	011 + 012
25	AFTIN-EXP-RIMS-FB				2/1/96		✓			✓	015 + 019
26	AFTIN-EXP-RIMS-FX				2/1/96		✓			✓	016 + 017

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

FB = FHS + BHS Composite
FX = FILT + XAD Composite

2/20/96 Corrected Date collection
AC251026 per SPN# 96PM0020

DATE/REVISIONS:
2/12/96 1. 625A added to 013, 018, 023, 024, 025
2. 026 per 96PM0090
2/14/96 3. All matrix's on all samples
4. are Air per SPN# 96PM0098
5. DRO Added to 004, 013, 020, 021, 023
6. + 024 per 96PM0097

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]		2/2/96	1:00				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381-596a

Explosive Sample QC/Data Summary

Roy F. Weston, Inc. - Lionville Laboratory
Explosives by HPLC / Method 8330

RFW Batch Number: 9602L916 Client: COE-HOT GAS Work Order: 02281-012-012-1200-00 Report Date: 02/15/96 11:00

014

Sample Information	Cust ID:	AFTOUT-EXP/S V-R1-CND	fl	IN/OUT-EXP/S V-SB-ACE	fl	IN/OUT-EXP/S V-SB-CND	fl	AFTIN-EXP-R1 -CND	fl	AFTIN-EXP-R1 -CND	fl	AFTIN-EXP-R1 MS-CND	fl
	RFW#:	004		006		009		013		013 DL		018	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		2.00		1.00		100		5000		1.00	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	72	%	68	%	74	%	D	%	D	%	84	%
HMX		2.2	U	4.4	U	2.2	U	220	U	11000	U	2.2	U
RDX		1.0	U	2.0	U	1.0	U	1400		5000	U	1.8	
1,3,5-Trinitrobenzene		0.50	U	1.0	U	0.50	U	600		2500	U	3.0	
1,3-Dinitrobenzene		0.52	U	1.0	U	0.52	U	52	U	2600	U	0.52	U
Nitrobenzene		0.52	U	1.0	U	0.52	U	52	U	2600	U	0.52	U
Tetryl		1.5	U	2.9	U	1.5	U	290		7300	U	1.5	U
2,4,6-Trinitrotoluene		0.50	U	1.0	U	0.50	U	23000	E	23000		44	E
2,6-Dinitrotoluene		0.50	U	1.0	U	0.50	U	50	U	2500	U	0.50	U
2,4-Dinitrotoluene		0.50	U	1.0	U	0.50	U	28		2500	U	0.50	U

Sample Information	Cust ID:	AFTIN-EXP-R1 MS-CND	fl	AFTOUT-EXP/S V-R1-FB	fl	AFTOUT-EXP/S V-R1-FX	fl	IN/OUT-EXP/S V-SB-FX	fl	AFTIN-EXP-R1 -FB	fl	AFTIN-EXP-R1 -FB	fl
	RFW#:	018 DL		020		021		022		023		023 DL	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	10.0		1.00		1.00		1.00		100		40000	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	D	%	70	%	60	%	75	%	D	%	D	%
HMX		22	U	2.2	U	22	U	22	U	220	U	88000	U
RDX		10	U	1.0	U	10	U	10	U	390		40000	U
1,3,5-Trinitrobenzene		5.0	U	0.50	U	5.0	U	5.0	U	170		20000	U
1,3-Dinitrobenzene		5.2	U	0.52	U	5.2	U	5.2	U	52	U	21000	U
Nitrobenzene		5.2	U	0.52	U	5.2	U	5.2	U	52	U	21000	U
Tetryl		15	U	1.5	U	15	U	15	U	150	U	58000	U
2,4,6-Trinitrotoluene		40		0.50	U	5.0	U	5.0	U	32000	E	29000	
2,6-Dinitrotoluene		5.0	U	0.50	U	5.0	U	5.0	U	50	U	20000	U
2,4-Dinitrotoluene		5.0	U	0.50	U	5.0	U	5.0	U	50	U	20000	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

015

Sample Information													
	Cust ID:	AFTIN-EXP-R1 -FX		AFTIN-EXP-R1 -FX		AFTIN-EXP-R1 MS-FB		AFTIN-EXP-R1 MS-FX		AFTIN-EXP-R1 MS-FX		BLK	
	RFW#:	024		024 DL		025		026		026 DL		96LLC013-MB1	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		100		2.00		1.00		2.00		1.00	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	106	%	D	%	70	%	62	%	D	%	76	%
			fl		fl		fl		fl		fl		fl
HMX		22	U	2200	U	4.4	U	22	U	44	U	2.2	U
RDX		88		1000	U	2.0	U	10	U	20	U	1.0	U
1,3,5-Trinitrobenzene		84		500	U	1.0	U	5.0		10	U	0.50	U
1,3-Dinitrobenzene		14		520	U	1.0	U	5.2	U	10	U	0.52	U
Nitrobenzene		5.2	U	520	U	1.0	U	5.2	U	10	U	0.52	U
Tetryl		26		1500	U	2.9	U	15	U	29	U	1.5	U
2,4,6-Trinitrotoluene		3600	E	4000		1.6		110	E	110		0.50	U
2,6-Dinitrotoluene		5.0	U	500	U	1.0	U	5.0	U	10	U	0.50	U
2,4-Dinitrotoluene		48		500	U	1.0	U	5.0	U	10	U	0.50	U

Sample Information													
	Cust ID:	BLK BS		BLK		BLK BS		BLK		BLK BS			
	RFW#:	96LLC013-MB1		96LLC017-MB1		96LLC017-MB1		96LLC014-MB1		96LLC014-MB1			
	Matrix:	AIR		AIR		AIR		AIR		AIR			
	D.F.:	1.00		2.00		2.00		1.00		1.00			
	Units:	total ug		total ug		total ug		total ug		total ug			
Surrogate:	1,2-Dinitrobenzene	74	%	45	%	26	%	66	%	74	%		
			fl		fl		fl		fl		fl		fl
HMX		70	%	4.4	U	18	%	22	U	72	%		
RDX		62	%	2.0	U	29	%	10	U	66	%		
1,3,5-Trinitrobenzene		79	%	1.0	U	21	%	5.0	U	26	%		
1,3-Dinitrobenzene		74	%	1.0	U	27	%	5.2	U	78	%		
Nitrobenzene		76	%	1.0	U	36	%	5.2	U	83	%		
Tetryl		88	%	2.9	U	0 *	%	15	U	18	%		
2,4,6-Trinitrotoluene		87	%	1.0	U	13	%	5.0	U	73	%		
2,6-Dinitrotoluene		82	%	1.0	U	23	%	5.0	U	84	%		
2,4-Dinitrotoluene		80	%	1.0	U	21	%	5.0	U	82	%		

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

SMD 2/15/96

2F

~~SOIL~~ ORGANICS SURROGATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot No.: 9602L916

GC Column(1): OD5/DA ID: OD5/ (mm) GC Column(2): ID: OD5 (mm)

	CLIENT SAMPLE NO.	1 %REC #	2 %REC #	1 %REC #	2 %REC #	1 %REC #	2 %REC #	TOT OUT
01	AFTOUT-EXP/SV-R1-CND	72						0
02	IN/OUT-EXP/SV-SB-ACE	68						0
03	IN/OUT-EXP/SV-SB-CND	74						0
04	AFTIN-EXP-R1-CND	D						0
05	AFTIN-EXP-R1-CND	D						0
06	AFTIN-EXP-R1MS-CND	84						0
07	AFTIN-EXP-R1MS-CND	D						0
08	AFTOUT-EXP/SV-R1-FB	70						0
09	AFTOUT-EXP/SV-R1-FX	60						0
10	IN/OUT-EXP/SV-SB-FX	75						0
11	AFTIN-EXP-R1-FB	D						0
12	AFTIN-EXP-R1-FB	D						0
13	AFTIN-EXP-R1-FX	106						0
14	AFTIN-EXP-R1-FX	D						0
15	AFTIN-EXP-R1MS-FB	70						0
16	AFTIN-EXP-R1MS-FX	62						0
17	AFTIN-EXP-R1MS-FX	D						0
18	BLK	76						0
19	BLKBS	74						0
20	BLK	45						0
21	BLKBS	26						0
22	BLK	66						0
23	BLKBS	74						0

ADVISORY
QC LIMITS

= 1,2-Dinitrobenzene (1-999)

\# Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

No Control Limits Available

SMD 2/15/96

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Client : COE-HOT GAS   RFW Lot No.: 96LLC013-MB1

BLANK Spike - Sample No.: BLK

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	22.0	0	15	70	1-999
RDX	10.0	0	6.2	62	1-999
1,3,5-Trinitrobenzene	2.50	0	2.0	79	1-999
1,3-Dinitrobenzene	2.50	0	1.8	74	1-999
Nitrobenzene	2.60	0	2.0	76	1-999
Tetryl	6.50	0	5.7	88	1-999
2,4,6-Trinitrotoluene	2.50	0	2.2	87	1-999
2,6-Dinitrotoluene	2.60	0	2.1	82	1-999
2,4-Dinitrotoluene	2.50	0	2.0	80	1-999

[illegible] 2/15/96

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 9 outside limits

COMMENTS: No Control Limits Available

[illegible]
2/15/96

FORM III ORG-2   V4.1

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client : COE-HOT GAS RFW Lot No.: 96LLC014-MB1

BLANK Spike - Sample No.: BLK

KLD 2/15/96

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	220	0	160	72	1-999
RDX	100	0	66	66	1-999
1,3,5-Trinitrobenzene	25.0	0	6.4	26	1-999
1,3-Dinitrobenzene	25.0	0	20	78	1-999
Nitrobenzene	26.0	0	22	83	1-999
Tetryl	65.0	0	11	18	1-999
2,4,6-Trinitrotoluene	25.0	0	18	73	1-999
2,6-Dinitrotoluene	26.0	0	22	84	1-999
2,4-Dinitrotoluene	25.0	0	21	82	1-999

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 9 outside limits

COMMENTS: Control Limits Not Available

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Client : COE-HOT GAS   RFW Lot No.: 96LLC017-MB1

BLANK Spike - Sample No.: BLK

JMD 2/15/96

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	22.0	0	4.0	18	1-999
RDX	10.0	0	2.9	29	1-999
1,3,5-Trinitrobenzene	2.50	0	0.52	21	1-999
1,3-Dinitrobenzene	2.50	0	0.68	27	1-999
Nitrobenzene	2.60	0	0.94	36	1-999
Tetryl	6.50	0	0	0 *	1-999
2,4,6-Trinitrotoluene	2.50	0	0.32	13	1-999
2,6-Dinitrotoluene	2.60	0	0.60	23	1-999
2,4-Dinitrotoluene	2.50	0	0.52	21	1-999

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 9 outside limits

COMMENTS: Tetryl not recovered in K-D procedure

Recovery Limits Not Available

JMD
2/15/96

4C

ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC013-MB1 Lab File ID: 02089646.04

Matrix:(soil/water) AIR Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _ Date Extracted: 02/07/96

Date Analyzed (1): 02/08/96 Date Analyzed (2): ______

Time Analyzed (1): 1204 Time Analyzed (2): ____

Instrument ID (1): 46 Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/(mm) GC Column (2): ID: ____(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	AFTOUT-EXP/S	9602L916-004	02/08/96	
02	IN/OUT-EXP/S	9602L916-009	02/08/96	
03	AFTIN-EXP-R1	9602L916-013	02/08/96	
04	AFTIN-EXP-R1	9602L916-013	02/08/96	
05	AFTIN-EXP-R1	9602L916-018	02/08/96	
06	AFTIN-EXP-R1	9602L916-018	02/08/96	
07	BLKBS	96LLC013-MB1S	02/08/96	

COMMENTS:

4C
ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC014-MB1   Lab File ID: 02089646.11

Matrix:(soil/water) AIR   Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _   Date Extracted: 02/07/96

Date Analyzed (1): 02/08/96   Date Analyzed (2): ____

Time Analyzed (1): 1421   Time Analyzed (2): ____

Instrument ID (1): 46   Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/(mm)   GC Column (2): ID: ____(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	AFTOUT-EXP/S	9602L916-021	02/08/96	
02	IN/OUT-EXP/S	9602L916-022	02/08/96	
03	AFTIN-EXP-R1	9602L916-024	02/08/96	
04	AFTIN-EXP-R1	9602L916-024	02/08/96	
05	AFTIN-EXP-R1	9602L916-026	02/08/96	
06	AFTIN-EXP-R1	9602L916-026	02/10/96	
07	BLKBS	96LLC014-MB1S	02/08/96	

COMMENTS: ____________________

2/12/96

4C

ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC017-MB1   Lab File ID: 02099646.16

Matrix: (soil/water) AIR   Extraction: (SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _   Date Extracted: 02/08/96

Date Analyzed (1): 02/09/96   Date Analyzed (2): ______

Time Analyzed (1): 1351   Time Analyzed (2): ____

Instrument ID (1): 46   Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/ (mm)   GC Column (2): ID: ____ (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	IN/OUT-EXP/S	9602L916-006	02/09/96	
02	AFTOUT-EXP/S	9602L916-020	02/08/96	
03	AFTIN-EXP-R1	9602L916-023	02/09/96	
04	AFTIN-EXP-R1	9602L916-023	02/08/96	
05	AFTIN-EXP-R1	9602L916-025	02/09/96	
06	BLKBS	96LLC017-MB1S	02/09/96	

COMMENTS: ______________________

Analysis Run Logs

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2-21-96

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: HPLC #1
DETECTOR: HP 1050 DAD
WAVELENGTH: 254nm
CALIBRATION STANDARD 461118

MOBILE PHASE: 54% H_2O, 32.7% MeOH, 13.2% ACN, 0.1% IPA @ 38°C
COLUMN TYPE: B+J ODS 25cm x 4.6mm
SPIKING STANDARD ✓ 461129

ANALYST: G. Leinweber
FLOW RATE: 1.4ml/min
COLUMN SERIAL #: 21856

01	01249646.01	RAW2:AO667551	01/24/96 16:23:23	STD 461118F	
02	01249646.02	RAW2:AO667554	01/24/96 16:43:07	STD 461118E	
03	01249646.03	RAW2:[illegible]67557	01/24/96 17:02:54	STD 461118D	46124
04	01249646.04	RAW2:AO667560	01/24/96 17:22:36	STD 461118C	06330 Primary
05	01249646.05	RAW2:AO667569	01/24/96 17:42:17	STD 461118B	
06	01249646.06	RAW2:AO667572	01/24/96 18:02:00	STD 461118A	
07	01249646.07	RAW2:AO667577	01/24/96 18:21:40	0X	

G. Leinweber 1/31/96

G. Leinweber 1/31/96

COMMENTS

RFW 21-21-022/B-01/92

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See Page 1 ANALYST: ______

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION		ID #	COMMENTS
					Dilution		
01	02089646.01	RAW2:B8672894	02/08/96 11:05:02	STD 461118D			
02	02089646.02	RAW2:B8672922	02/08/96 11:24:42	STD 461118D			
03	02089646.03	RAW2:B8672928	02/08/96 11:44:23	STD 461118D			
04	02089646.04	RAW2:B8672932	02/08/96 12:04:01	96LLC013-MB1			
05	02089646.05	RAW2:B8672939	02/08/96 12:23:40	96LLC013-MB1S			
06	02089646.06	RAW2:B8672946	02/08/96 12:43:20	9602L916-004			
07	02089646.07	RAW2:B8672953	02/08/96 13:02:58	9602L916-009			
08	02089646.08	RAW2:B8672956	02/08/96 13:22:35	9602L916-018			
09	02089646.09	RAW2:B8672966	02/08/96 13:42:12	9602L916-013	100		
10	02089646.10	RAW2:B8672968	02/08/96 14:01:50	INST. BLANK			
11	02089646.11	RAW2:B8672978	02/08/96 14:21:30	96LLC014-MB1			
12	02089646.12	RAW2:B8672985	02/08/96 14:41:07	96LLC014-MB1S			
13	02089646.13	RAW2:B8672989	02/08/96 15:00:46	9602L916-021			
14	02089646.14	RAW2:B8672994	02/08/96 15:20:24	9602L916-022			
15	02089646.15	RAW2:B8673003	02/08/96 15:40:02	IBLK			
16	02089646.16	RAW2:B8673016	02/08/96 15:59:43	STD 461118D			
17	02089646.17	RAW2:B8673023	02/08/96 16:19:21	9602L916-024			
18	02089646.18	RAW2:B8673026	02/08/96 16:38:57	9602L916-026			
19	02089646.19	RAW2:B8673031	02/08/96 16:58:34	96LLC015-MB1			
20	02089646.20	RAW2:B8673040	02/08/96 17:18:11	96LLC015-MB1S			
21	02089646.21	RAW2:B8673045	02/08/96 17:37:50	9602L963-004			
22	02089646.22	RAW2:B8673053	02/08/96 17:57:28	9602L963-009			
23	02089646.23	RAW2:B8673063	02/08/96 18:17:03	9602L963-014			
24	02089646.24	RAW2:B8673067	02/08/96 18:36:39	9602L963-019	1000		

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RFW 21-21-022/B-01/92

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____ MOBILE PHASE: See Page 1 ANALYST: ____

DETECTOR: ____ FLOW RATE: ____

WAVELENGTH: ____ COLUMN TYPE: ____ COLUMN SERIAL #: ____

CALIBRATION STANDARD ____ SPIKING STANDARD ____

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02089646.25	RAW2:B8673074			02/08/96 18:56:15	9602L963-024 5000		
26	02089646.26	RAW2:B8673078			02/08/96 19:15:53	9602L916-018D1		
27	02089646.27	RAW2:B8673083			02/08/96 19:35:30	IBLK		
28	02089646.28	RAW2:B8673091			02/08/96 19:55:11	STD 461118D		
29	02089646.29	RAW2:B8673099			02/08/96 20:14:46	9602L916-013D1 5000		
30	02089646.30	RAW2:B8673105			02/08/96 20:34:22	9602L963-019D1 100		
31	02089646.31	RAW2:B8673114			02/08/96 20:54:01	9602L963-024D1 100		
32	02089646.32	RAW2:B8673119			02/08/96 21:13:37	9602L916-024D1 100		
33	02089646.33	RAW2:B8673124			02/08/96 21:33:12	INST. BLANK		
34	02089646.34	RAW2:B8673131			02/08/96 21:52:48	9602L916-020	[illegible]	
35	02089646.35	RAW2:B8673138			02/08/96 22:12:24	9602L916-023 2000	40000	
36	02089646.36	RAW2:B8673145			02/08/96 22:32:02	9602L963-030		
37	02089646.37	RAW2:B8673152			02/08/96 22:51:38	9602L963-032 5000		
38	02089646.38	RAW2:B8673155			02/08/96 23:11:14	9602L963-034 5000		
39	02089646.39	RAW2:B8673166			02/08/96 23:30:49	9602L963-032D1 100		
40	02089646.40	RAW2:B8673169			02/08/96 23:50:26	INST. BLANK		
41	02089646.41	RAW2:B9673178			02/09/96 00:10:07	STD 461118D		
42	02089646.42	RAW2:B9673183			02/09/96 00:29:45	9602L963-034D1 100		
43	02089646.43	RAW2:B9673190			02/09/96 00:49:20	INST. BLANK		
44	02089646.44	RAW2:B9673195			02/09/96 01:09:01	STD 461118D		

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REVIEWED BY/DATE G. Leinweber 2/11/96

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____
DETECTOR: ____
WAVELENGTH: ____
CALIBRATION STANDARD ____

MOBILE PHASE: See Page 1
COLUMN TYPE: ____
SPIKING STANDARD ____

ANALYST: ____
FLOW RATE: ____
COLUMN SERIAL #: ____

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	Dilution	IT ID #	COMMENTS
01	02099646.01	RAW2:B9673290	02/09/96 08:56:39	STD 461118D			
02	02099646.02	RAW2:B9673299	02/09/96 09:16:19	STD 461118D			
03	02099646.03	RAW2:B9673300	02/09/96 09:35:59	STD 461118D			
04	02099646.04	RAW2:B9673307	02/09/96 09:55:39	9602L963-004			Sequence Position Sample ID 02/14/96
05	02099646.05	RAW2:B9673311	02/09/96 10:15:18	9602L963-009			
06	02099646.06	RAW2:B9673322	02/09/96 10:34:57	9602L963-014			09 96LLC017-MB1S
07	02099646.07	RAW2:B9673324	02/09/96 10:54:36	9602L916-023D1	100		10 9602L916-006
08	02099646.08	RAW2:B9673331	02/09/96 11:14:13	96LLC014-MB1S			
09	02099646.09	RAW2:B9673337	02/09/96 11:33:51	96LLC017-MB1			11 9602L916-025
10	02099646.10	RAW2:B9673341	02/09/96 11:53:30	96LLC017-MB1~~S~~	2		12 9602L963-026
11	02099646.11	RAW2:B9673353	02/09/96 12:13:09	9602L916-~~006~~ 025	2		
12	02099646.12	RAW2:B9673374	02/09/96 12:32:47	9602L~~916-025~~	2	→963-026	13 9602L963-028
13	02099646.13	RAW2:B9673380	02/09/96 12:52:24	9602L963-~~026~~ 28	2		
14	02099646.14	RAW2:B9673391	02/09/96 13:12:02	IBLK			16 96LLC017-MB1
15	02099646.15	RAW2:B9673399	02/09/96 13:31:43	STD 461118D		2/14/96	
16	02099646.16	RAW2:B9673415	02/09/96 13:51:22	~~9602L963-028~~	2		→96LLC017-MB1
17	02099646.17	RAW2:B9673418	02/09/96 14:10:59	96LLC016-MB1			
18	02099646.18	RAW2:B9673421	02/09/96 14:30:35	96LLC016-MB1S			
19	02099646.19	RAW2:B9673433	02/09/96 14:50:12	9602L963-027			
20	02099646.20	RAW2:B9673439	02/09/96 15:09:50	9602L963-029			
21	02099646.21	RAW2:B9673448	02/09/96 15:29:29	9602L963-031			
22	02099646.22	RAW2:B9673460	02/09/96 15:49:07	9602L963-033	100		
23	02099646.23	RAW2:B9673464	02/09/96 16:08:43	9602L963-035	100		
24	02099646.24	RAW2:B9673467	02/09/96 16:28:19	9602L963-033D1			

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____
DETECTOR: ____
WAVELENGTH: ____
CALIBRATION STANDARD ____

MOBILE PHASE: Seelage 1
COLUMN TYPE: ____
SPIKING STANDARD ____

ANALYST: ____
FLOW RATE: ____
COLUMN SERIAL #: ____

ANALYSIS DATE	TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02099646.25	RAW2:B9673477			02/09/96 16:47:56	9602L963-035D1		
26	02099646.26	RAW2:B9673489			02/09/96 17:07:34	IBLK		
27	02099646.27	RAW2:B9673495			02/09/96 17:27:15	STD 461118D		
28	02099646.28	RAW2:B9673499			02/09/96 17:46:51	96LLC017-MB1A1		
29	02099646.29	RAW2:B9673513			02/09/96 18:06:27	96LLC017-MB1SA		
30	02099646.30	RAW2:B9673517			02/09/96 18:26:04	9602L916-006A1		
31	02099646.31	RAW2:B9673524			02/09/96 18:45:42	9602L916-025A1		
32	02099646.32	RAW2:B9673535			02/09/96 19:05:19	9602L963-026A1		
33	02099646.33	RAW2:B9673539			02/09/96 19:24:54	9602L963-028A1		
34	02099646.34	RAW2:B9673550			02/09/96 19:44:29	96LLC019-MB1		
35	02099646.35	RAW2:B9673560			02/09/96 20:04:06	96LLC019-MB1S		
36	02099646.36	RAW2:B9673569			02/09/96 20:23:44	9602L974-001 100		
37	02099646.37	RAW2:B9673577			02/09/96 20:43:21	9602L999-001 100		
38	02099646.38	RAW2:B9673581			02/09/96 21:02:57	IBLK		
39	02099646.39	RAW2:B9673591			02/09/96 21:22:38	STD 461118D		
40	02099646.40	RAW2:B9673604			02/09/96 21:42:15	9602L999-002 100		
41	02099646.41	RAW2:B9673612			02/09/96 22:01:53	9602L974-001D1		
42	02099646.42	RAW2:B9673622			02/09/96 22:21:31	9602L999-001A1	2/10/96	
43	02099646.43	RAW2:B9673633			02/09/96 22:41:09	9602L999-002D1		
44	02099646.44	RAW2:B9673641			02/09/96 23:00:43	9602L963-035D2 10		
45	02099646.45	RAW2:B9673645			02/09/96 23:20:20	96LLC018-MB1		
46	02099646.46	RAW2:B9673658			02/09/96 23:39:58	96LLC018-MB1S		
47	02099646.47	RAW2:B9673663			02/09/96 23:59:36	9602L952-001		
48	02099646.48	RAW2:BA673672			02/10/96 00:19:12	9602L952-002		

RFW 21-21-022/B-01/92

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: Sexlage 1 ANALYST: ______

DETECTOR: ______ ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO.	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
49	02099646.49	RAW2:BA673682			02/10/96 00:38:47	9602L952-003		
50	02099646.50	RAW2:BA673691			02/10/96 00:58:24	INST. BLANK		
51	02099646.51	RAW2:BA673693			02/10/96 01:18:05	STD 461118D		
52	02099646.52	RAW2:BA673703			02/10/96 01:37:43	9602L952-004		
53	02099646.53	RAW2:BA673712			02/10/96 01:57:18	9602L952-005		
54	02099646.54	RAW2:BA673717			02/10/96 02:16:53	9602L952-007		
55	02099646.55	RAW2:BA673724			02/10/96 02:36:30	9602L952-008		
56	02099646.56	RAW2:BA673734			02/10/96 02:56:09	9602L952-009		
57	02099646.57	RAW2:BA673743			02/10/96 03:15:46	9602L952-010		2/10/96
58	02099646.58	RAW2:BA673749			02/10/96 03:35:22	9602L952-011		
59	02099646.59	RAW2:BA673753			02/10/96 03:54:56	9602L952-012		
60	02099646.60	RAW2:BA673765			02/10/96 04:14:33	9602L952-013		
61	02099646.61	RAW2:BA673770			02/10/96 04:34:11	9602L952-014		
62	02099646.62	RAW2:BA673774			02/10/96 04:53:49	INST. BLANK		
63	02099646.63	RAW2:BA673781			02/10/96 05:13:29	STD 461118D		
64	02099646.64	RAW2:BA673788			02/10/96 05:33:05	9602L952-015		
65	02099646.65	RAW2:BA673792			02/10/96 05:52:42	9602L952-015S		
66	02099646.66	RAW2:BA673797			02/10/96 06:12:23	9602L952-015T		
67	02099646.67	RAW2:BA673805			02/10/96 06:32:01	9602L952-016		
68	02099646.68	RAW2:BA673810			02/10/96 06:51:38	INST. BLANK		
69	02099646.69	RAW2:BA673815			02/10/96 07:11:18	STD 461118D		

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REVIEWED BY/DATE G. Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See Page 1 ANALYST: ______ 204

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

ANALYSIS	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	LOT ID #	COMMENTS
01	02109646.01	RAW2:BA673848	02/10/96 09:24:51	STD 461118D		
02	02109646.02	RAW2:BA673863	02/10/96 09:44:32	STD 461118D		
03	02109646.03	RAW2:BA673869	02/10/96 10:04:12	STD 461118D		
04	02109646.04	RAW2:BA673875	02/10/96 10:23:50	9602L952-005		
05	02109646.05	RAW2:BA673881	02/10/96 10:43:30	9602L916-026D1 2		
06	02109646.06	RAW2:BA673891	02/10/96 11:03:11	9602L952-008		
07	02109646.07	RAW2:BA673902	02/10/96 11:22:50	9602L952-015S		
08	02109646.08	RAW2:BA673908	02/10/96 11:42:30	~~INST. BLANK~~ STD 461118D		

End of Run

2/12/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: HPLC #2
DETECTOR: HP 1050 UV
WAVELENGTH: 254 nm
CALIBRATION STANDARD 461130/41024011

MOBILE PHASE: 60% H_2O/40% ACN
30°C
COLUMN TYPE: Zorbax C8 4.6mm x 25cm
SPIKING STANDARD NA

ANALYST: G. Leinweber
FLOW RATE: 1.5 ml/min
COLUMN SERIAL #: L17344

						COMMENTS
01	02069602.01	RAW2:B6672149	02/06/96 09:41:44	STD 461130F		
02	02069602.02	RAW2:B6672161	02/06/96 10:19:20	STD 461130E		
03	02069602.03	RAW2:B6672171	02/06/96 10:56:55	STD 461130D	06330	
04	02069602.04	RAW2:B6672180	02/06/96 11:34:29	STD 461130C	02Z06	
05	02069602.05	RAW2:B6672186	02/06/96 12:12:05	STD 461130B		
06	02069602.06	RAW2:B6672197	02/06/96 12:49:40	STD 461130A		
07	02069602.07	RAW2:B6672208	02/06/96 13:27:15	STD 41024011F		
08	02069602.08	RAW2:B6672221	02/06/96 14:28:04	STD 41024011E		
09	02069602.09	RAW2:B6672232	02/06/96 14:50:37	STD 41024011D	4-NT	
10	02069602.10	RAW2:B6672236	02/06/96 15:13:12	STD 41024011C	02F06	
11	02069602.11	RAW2:B6672243	02/06/96 15:35:47	STD 41024011B		
12	02069602.12	RAW2:B6672251	02/06/96 15:58:21	STD 41024011A		
13	02069602.13	RAW2:B6672258	02/06/96 16:20:55	OX		
14	02069602.14	RAW2:B6672264	02/06/96 16:43:29	9601L838-001		
15	02069602.15	RAW2:B6672274	02/06/96 17:06:02	9601L838-002		
16	02069602.16	RAW2:B6672281	02/06/96 17:28:37	9601L838-004		
17	02069602.17	RAW2:B6672292	02/06/96 17:51:12	9601L838-006		
18	02069602.18	RAW2:B6672301	02/06/96 18:13:43	9601L838-008		
19	02069602.20	RAW2:B6672318	02/06/96 18:58:48	INST. BLANK		
20	02069602.21	RAW2:B6672324	02/06/96 19:21:22	STD 461130D		
21	02069602.22	RAW2:B6672339	02/06/96 19:43:56	STD 41024011D		

G. Leinweber 2/9/96

G. Leinweber 2/9/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE [signature] 2/12/96

PAGE # 8

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See Page 8 ANALYST: ______

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	Dilution	)T ID #	COMMENTS
01	02099602.01	RAW2:B9673441	02/09/96 15:20:12	STD 461130D			
02	02099602.02	RAW2:B9673457	02/09/96 15:42:49	STD 461130D			
03	02099602.03	RAW2:B9673463	02/09/96 16:05:26	STD 461130D			
04	02099602.04	RAW2:B9673468	02/09/96 16:29:37	9602L916-018			Used 022A6 without
05	02099602.05	RAW2:B9673482	02/09/96 16:52:12	9602L916-018D1	10		level A.
06	02099602.06	RAW2:B9673490	02/09/96 17:14:48	9602L916-013	5000		and 02206 for
07	02099602.07	RAW2:B9673498	02/09/96 17:37:24	9602L916-024			TACEM Ga 2/12/96
08	02099602.08	RAW2:B9673510	02/09/96 17:59:57	9602L916-024D1	10		
09	02099602.09	RAW2:B9673516	02/09/96 18:22:31	9602L916-026			
10	02099602.10	RAW2:B9673525	02/09/96 18:45:06	9602L963-019	100		
11	02099602.11	RAW2:B9673536	02/09/96 19:07:41	9602L963-019D1	1000		
12	02099602.12	RAW2:B9673545	02/09/96 19:30:15	9602L963-024	50		
13	02099602.13	RAW2:B9673555	02/09/96 19:52:49	9602L963-024D1	5000		
14	02099602.14	RAW2:B9673566	02/09/96 20:15:22	IBLK			
15	02099602.15	RAW2:B9673572	02/09/96 20:37:56	STD 461130D			
16	02099602.16	RAW2:B9673580	02/09/96 21:00:31	9602L916-020		Ga 2/12/96	
17	02099602.17	RAW2:B9673594	02/09/96 21:23:05	9602L916-023	~~100~~ 40000		
18	02099602.18	RAW2:B9673607	02/09/96 21:45:37	9602L916-023D1	20000		
19	02099602.19	RAW2:B9673617	02/09/96 22:08:09	9602L963-030			
20	02099602.20	RAW2:B9673625	02/09/96 22:30:43	9602L963-032	50		
21	02099602.21	RAW2:B9673640	02/09/96 22:53:17	9602L963-034	50		
22	02099602.22	RAW2:B9673644	02/09/96 23:15:50	9602L916-013D1	100		
23	02099602.23	RAW2:B9673657	02/09/96 23:38:21	9602L974-001	100		
24	02099602.24	RAW2:B9673666	02/10/96 00:00:53	9602L999-001	100		

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____________ MOBILE PHASE: See page 8 ANALYST: ____________ 207

DETECTOR: ____________ FLOW RATE: ____________

WAVELENGTH: ____________ COLUMN TYPE: ____________ COLUMN SERIAL #: ____________

CALIBRATION STANDARD ____________ SPIKING STANDARD ____________

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02099602.25			RAW2:BA673675	02/10/96 00:23:26	9602L999-002	100	
26	02099602.26			RAW2:BA673685	02/10/96 00:46:01	IBLK		
27	02099602.27			RAW2:BA673692	02/10/96 01:08:34	STD 461130D		
28	02099602.28			RAW2:BA673702	02/10/96 01:31:05	9602L963-033		
29	02099602.29			RAW2:BA673709	02/10/96 01:53:36	9602L963-033D1	100	
30	02099602.30			RAW2:BA673718	02/10/96 02:16:08	9602L963-035	10	
31	02099602.31			RAW2:BA673727	02/10/96 02:38:42	9602L963-035D1	100	
32	02099602.32			RAW2:BA673735	02/10/96 03:01:14	IBLK	[illegible] 2/10/96	
33	02099602.33			RAW2:BA673746	02/10/96 03:23:46	461130D		

End of [illegible] [illegible]

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. [illegible] 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____ MOBILE PHASE: See Page 8 ANALYST: ____

DETECTOR: ____ FLOW RATE: ____

WAVELENGTH: ____ COLUMN TYPE: ____ COLUMN SERIAL #: ____

CALIBRATION STANDARD ____ SPIKING STANDARD ____

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	DT ID #	COMMENTS
01	02109602.01	RAW2:BA673850	02/10/96 09:26:27	STD 461130D		
02	02109602.02	RAW2:BA673868	02/10/96 09:49:04	STD 461130D		
03	02109602.03	RAW2:BA673872	02/10/96 10:11:41	STD 461130D		
04	02109602.04	RAW2:BA673878	02/10/96 10:34:19	9602L916-025 2		
05	02109602.05	RAW2:BA673889	02/10/96 10:56:54	9602L916-026D1 2		
06	02109602.06	RAW2:BA673898	02/10/96 11:19:29	9602L952-004		
07	02109602.07	RAW2:BA673909	02/10/96 11:42:05	9602L952-009		
08	02109602.08	RAW2:BA673915	02/10/96 12:04:38	9602L952-010		
09	02109602.09	RAW2:BA673924	02/10/96 12:27:11	9602L963-032D1 200		
10	02109602.10	RAW2:BA673929	02/10/96 12:49:46	9602L963-034D1 200		
11	02109602.11	RAW2:BA673936	02/10/96 13:12:22	IBLK		
12	02109602.12	RAW2:BA673947	02/10/96 13:34:57	STD 461130D		

Dtulcon

2/12/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Heinmeh 2/12/96

PAGE # 11

WESTON

Standards Preparation Records

WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

Explosives Calibration Mix
Recd 8/...

MIXTURE I.D.#: 461118 EXPIRATION DATE: Ongoing-

DATE/ANALYST: CK 9/1/95 DATE REMOVED[1]:

Logbook #: 4611

210

	STOCK PARENT	% PURITY	STANDARD	FINAL VOLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)

EM

EM SCIENCE
A Division of EM Industries, Inc.
P.O. Box 70
480 S. Democrat Road
Gibbstown, NJ 08027

Recd 3/21/95 CK 461118

CERTIFICATE OF ANALYSIS

[redacted]

PRODUCT: EPS00872
DESCRIPTION: Custom Explosives Calibration Mix
LOT #: 085-338
SOLVENT: AcCN : MeOH (9:1)

EXPIRATION: On-going Stability Program

15 Components

Component	CAS #	Purity % (GC/FID)	Gravimetric Concentration[1] (µg/mL)	Analyte Concentration[2] (µg/mL)
2-Amino-4,6-dinitrotoluene	35572-78-2	100 (GC/MS)	6.30	6.30
4-Amino-2,6-dinitrotoluene	1946-51-0	100 (GC/MS)	6.25	6.25
1,3-Dinitrobenzene	99-65-0	98.2	6.25	6.14
2,4-Dinitrotoluene	121-14-2	98.0	6.35	6.22
2,6-Dinitrotoluene	606-20-2	99.3	6.50	6.46
HMX	2691-41-0	99.3 (HPLC)	55.1	54.7
Nitrobenzene	98-95-3	100 (GC/MS)	6.54	6.54
2-Nitrotoluene	88-72-2	99.0	25.0	24.8
3-Nitrotoluene	99-08-1	99.2	25.0	24.8
4-Nitrotoluene	99-99-0	99.0	75.5	74.7
RDX	121-82-4	98.6	25.0	24.7
Tetryl	479-45-8	99.8 (HPLC)	18.4	18.4
TNT	118-96-7	100 (HPCL)	6.33	6.33
1,3,5-Trinitrobenzene	99-35-4	98.4	6.34	6.24
1,2-Dinitrobenzene	528-29-0	100	10.1	10.1

1. All weights are traceable through National Bureau of Standards Test No. 731/243889 'X'
2. Analyte Conc. = Purity x Gravimetric Conc.

Quality Control Manager: Charles M. Wilson

Call: (800) 222-0342

CK 9/1/95

Ampule ID	Date Opened	Disposal Date
A	9/1/95 GM	1/24/96 GM
B	1/24/96 GM	
C	~~.../.../96~~	
D		
E		
F		
G		
H		
I		
J		

[1]Date removed is the date the standards are given to the Waste Disposal Unit for disposition.

REVIEWED BY/DATE: CK 9/18/95

PAGE # 18

RFW 21-21-036/D-03/94

WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

211

MIXTURE I.D.#: 461129 Explosive Spike
DATE/ANALYST: 12/19/95 [signature]
EXPIRATION DATE: Ongoing - Tentative 1/1/97
DATE REMOVED[1]:
Logbook #: 4611

FINAL VOLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)

Rec'd 12/19/95 [initials]
461129

EM SCIENCE
A Division of EM Industries, Inc.
P.O. Box 70
480 S. Democrat Road
Gibbstown, NJ 08027

CERTIFICATE OF ANALYSIS

[redacted]

PRODUCT: EPS00314
EXPIRATION: On-going Stability Program
DESCRIPTION: Custom Explosives Spiking Mix
LOT #: 095-190
SOLVENT: AcCN : MeOH (9:1)
14 Components

Component	CAS #	Purity % (GC/FID)	Gravimetric Concentration[1] (µg/mL)	Analyte Concentration[2] (µg/mL)
2-Amino-4,6-dinitrotoluene	35572-78-2	100 (GC/MS)	20.02	20.02
4-Amino-2,6-dinitrotoluene	1946-51-0	100 (GC/MS)	20.00	20.00
1,3-Dinitrobenzene	99-65-0	98.2	20.00	19.64
2,4-Dinitrotoluene	121-14-2	98.0	20.00	19.60
2,6-Dinitrotoluene	606-20-2	99.3	21.00	20.85
HMX	2691-41-0	99.3	17.64	17.52
Nitrobenzene	98-95-3	99.9 (GC/MS)	21.56	21.54
2-Nitrotoluene	88-72-2	99.0	80.5	79.7
3-Nitrotoluene	99-08-1	99.2	80.2	79.6
4-Nitrotoluene	99-99-0	99.0	240.9	238.5
RDX	121-82-4	98.6	80.3	79.2
Tetryl	479-45-8	99.8	52.00	51.90
TNT	118-96-7	100 (GC/MS)	20.12	20.12
1,3,5-Trinitrobenzene	99-35-4	98.4	20.14	19.82

1. All weights are traceable through National Bureau of Standards Test No. 731/243869 's'
2. Analyte Conc. = Purity x Gravimetric Conc.

Quality Control Manager: [signature]
Charles M. Wilson

For Technical Assistance Call: (800) 222-0342

Ampule ID	Date Opened	Disposal Date
A	12/21/95 [initials]	
B	1/30/96 [initials]	
C		
D		
E		
F		
G		
H		
I		
J		

[initials] 2/13/97

[signature] 12/19/95

[1]Date removed is the date the standards are given to the waste disposal unit for disposition.

REVIEWED BY/DATE:

RFW 21-21-036/D-03/94

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WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

Logbook #: 4102

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
Kerosene	41023801	41021307	100 mg/mL	100uL	10mL	Hexane	1000ug/mL	5/25/95 Gm	[illegible] 6/23/95	[illegible] 8/1/95
Triphenylene	41023802	41021507	1000ug/mL	1250uL	25mL	ACN	50ug/mL	5/26/95 Gm	[illegible] 6/23/95	Gm 11/21/95
KEROSENE	41023803	AccuStandard 025-235		–	1mL	DCM	20 mg/mL	[illegible] 6/14/95	Gm 9/7/95	[illegible] 1/16/96
DIESEL FUEL	41023804	AccuStandard 055-314		–	5mL	DCM	50 mg/mL	[illegible] 6/14/95	Gm 9/7/95	
GASOLINE	41023805	AccuStd 123-180			1mL	Isooctane	100 mg/mL	[illegible] 6/14/95	Gm 9/7/95	[illegible] 1/16/96
DIESEL FUEL	41023806	AccuStd 084-259			1mL	Isooctane	100 mg/mL	[illegible] 6/14/95	Gm 9/7/95	[illegible] 1/16/96
JET TURBINE FUEL	41023807	AccuStd 123-192			1mL	Isooctane	100 mg/mL	[illegible] 6/14/95	Gm 9/7/95	[illegible] 1/16/96
HMX	41023808	EM Science 114-237			1mL	MeOH/ACN 1:1	993 ug/mL	[illegible] 6/14/95	Gm 9/7/95	1/16/96
RDX	41023809	EM Science 015-032			1mL		986 ug/mL	[illegible] 6/14/95	Gm 9/7/95	
1,3,5-TNB	41023810	EM Science 117-24			1mL		984 ug/mL	[illegible] 6/14/95	Gm 9/7/95	
1,3-DNB	41023811	EM Science 035-207			1mL		982 ug/mL	[illegible] 6/14/95	Gm 9/7/95	

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

Logbook #: 4102213

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
Nitrobenzene	41023901	EM Science 114-219	~~1000~~		1	MeOH/ACN 1:1	1000	CJ 6/14/95	Gm 9/7/95	
Tetryl	41023902	EM Science 025-101			1		1000	CJ 6/14/95	Gm 9/7/95	
2-Amino-4,6-DNT	41023903	EM Science 104-266			1		1002	CJ 6/14/95	Gm 9/7/95	
4-Amino-2,6-DNT	41023904	EM Science 114-239			1		1000	CJ 6/14/95	Gm 9/7/95	
TNT	41023905	EM Science 114-220			1		1000	CJ 6/14/95	Gm 9/7/95	
2,6-DNT	41023906	EM Science 124-511			1		1000	CJ 6/14/95	Gm 9/7/95	
2,4-DNT	41023907	EM Science 015-266			1		988	CJ 6/14/95	Gm 9/7/95	
2-Nitrotoluene	41023908	EM Science 104-334			1		990	CJ 6/14/95	Gm 9/7/95	
4-Nitrotoluene	41023909	EM Science 015-152			1		990	CJ 6/14/95	Gm 9/7/95	
3-Nitrotoluene	41023910	EM Science 114-238			1		993	CJ 6/14/95	Gm 9/7/95	
~~Ethylene Glycol~~	~~41023911~~	~~41020604~~	~~Neat~~						Gm	2/7/

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

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WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

214

MIXTURE I.D.#: 461130 Explosive Conf. mix EXPIRATION DATE: 6/1/96
DATE/ANALYST: 1/3/96 G. Leinweber DATE REMOVED[1]:

Logbook #: 4611

COMPONENT	DESCRIPTION	STOCK PARENT or NEAT ID	~~% PURITY~~ (neat only) Conc.	STANDARD WEIGHT/VOLUME (w/units)	FINAL VOLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)
HMX		41023808	993 ug/mL	276.9 uL	5 mL	ACN	55 ug/mL
RDX		41023809	986	136.9			27
1,3,5-TNB		41023810	984	32.0			6.3
1,3- DNB		41023811	982	32.1			6.3
Nitrobenzene		41023901	1000	32.5			6.5
Tetryl		41023902	1000	94.0			18.8
2-Amino-4,6-DNT		41023903	1002	31.4			6.3
TNT		41023905	1001	31.5			6.3
2,6- DNT		41023906	1000	32.5			6.5
2,4- DNT		41023907	988	31.9			6.3

[1]Date removed is the date the standards are given to the Waste Disposal Unit for disposition.

REVIEWED BY/DATE: [signature] 1/24/96

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RFW 21-21-036/D-03/94

WESTON®

Logbook #: 402

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HPLC STANDARDS LOGBOOK
NEAT STANDARDS DOCUMENTATION

COMPOUND	WESTON STANDARD ID	VENDOR	VENDOR LOT ID	PURITY %	EXPIRATION DATE	DATE RECEIVED	DATE REMOVED[1]	
Nitroglycerin	41020701	EM Science EPM80280	104.275		9/1/98	8/31/95 CS		1000 ug/mL
Ethylene Oxide	41020702	EM Science EPS00745	105-168		Ongoing	10/17/95 CS		1005 ug/mL
7H-Dibenzo(c,g)carbazole	41020703	EM Science EPH00134	920 331	99.7	Ongoing	10/31/95 CS		
Dibenzo(a,h) pyrene	41020704	EM Science EPH00136	06110	-	Ongoing	10/31/95 CS		50 ug/mL
Dibenzo(a,i) pyrene	41020705	Radian ERD-001	HKY-26044-57	99%		CS 10/31/95		
3-Methylcholanthrene	41020706	EM Science EPH00112	111-098	98.7	Ongoing	CS 10/31/95		
Benzo(j)fluoranthene	41020707	Radian ERB-005	CAP-24573-50	98		CS 10/31/95		
Dibenz(a,h)acridine	41020708	Radian ERD-013	HKY-27456-44	99		CS 10/31/95		
Dibenz(a,j)acridine	41020709	Radian ERD-014	HKY-27456-47	99		CS 10/31/95		
1,2-Dinitrobenzene	41020710	AccuStandard M-8330-55	095-233	98.6	Ongoing	CS 11/6/95		1003 ug/mL

RFW 21-21-036/F-03/94

REVIEWED BY/DATE: [signature] 11/6/95

[1]Date Removed is the date the standards are given to the Waste Disposal Unit for disposition.

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WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

2116

Logbook #: 4102

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
RDX	41024001	41020304	1002ug/ml	27ul	1ml	ACN	27.05ug/ml	8/24/95 Gm		1/16/96
RDX	41024002	41024001	27.05ug/ml ~~100ug~~ Gm 8/24/95	100ul	1ml	ACN	2.705ug/ml	8/24/95 Gm		1/16/96
Picric Acid	41024003	41021708	1010 ug/ml	1mL	10ml	ACN	101 ug/ml	8/29/95	Gm 9/5/95	
Picric Acid	41024004	41020609	1000	1mL	10mL	ACN	100 ug/mL	8/29/95	Gm 9/5/95	
~~2-H-dibenzo(cyl)carbazole~~	~~41024005~~	~~41020703~~	10/31/95							
Triphenylene	41024006	41021907 ~~41020101~~ Gm 11/5/95	1000ug/mL	1.250mL	25mL	ACN	50ug/mL	Gm 11/95	12/21/95	
Triphenylene surr (to use 1mL)	41024007	41021908	500ug/mL	1mL	100mL	ACN	5ug/mL	GDL 11/14/95		
~~MOTOR OIL 10W-30~~	~~41024008~~	~~41020103~~					Gm 12/5/95			
1,2-DNB surr	41024009	41020710	1003 ug/mL	0.810	10mL	ACN	81.243 ug/mL	Gm 12/20/95	12/21/95	
p-Terphenyl	41024010	39850303	NEAT ~~0.0125g~~	0.0125g	250ml	Acetone w/ DCM/MeOH	50 ug/ml	1/2/96	Gm 1/4/96	
4-Nitrotoluene	41024011	41023909	1.0mg/mL	74.7uL	1mL	ACN	74.7ug/mL	Gm 2/2/96		

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

PAGE #

Preparation Logs

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 46LLC013 SDG File Y/N: N/A

Analyst: F. Ihrig Test: 8330 Method: RSOE Solvent: ACN AAPrep: |

	RFW # (mL) Vol I	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank (770)	W		1 770	1.0	1.0	10	2	N
2	Blank Spike (770)			1		1.0			
3	96024916-004 (580)			1					
4	-009 (330)			1					
5	-013* (400)			1					
6	-018 (310)			1					
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

FI 2/8/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time: N/A

End time:

BN Fraction (Date/Time/Initials)

Start time: N/A

End time:

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: F. Ihrig 2/8/96

GPC Lab ID #: N/A

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to volume (770mls) w/ DI H_2O

* Bright yellow Extract => potentially high tgt Cmpds

Surrogate: 50ul #1024C09 Spike: 125ul 461129B Witness:

This Page Reviewed By/Date: [signature] 2/8/96 Reviewed Against LIMS By/DATE: F. Ihrig 2/8/96

RFW 21-21-019/Z-11/93

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/07/96 Extraction Batch No: 96LLC013 Analyst: FK Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/15/96 Solvent: Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
004 0	AFTOUT-EXP/SV-R1-CND	7	1	1.0		10		2.0	N	0.0	20
009 0	IN/OUT-EXP/SV-SB-CND	7	1	1.0		10		2.0	N	0.0	20
013 0	AFTIN-EXP-R1-CND	7	1	1.0		10		2.0	N	0.0	20
018 0	AFTIN-EXP-R1MS-CND	7	1	1.0		10		2.0	N	0.0	20
96LLC013-MB1 0	BLK	7	1	1.0		10		2.0	N	0.0	20
96LLC013-MB1 0S	BLK	7	1	1.0	1.0	10		2.0	N	0.0	20

Comments:
Surrogate: 50 uL 41024009
Spike: 125 uL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
	KND 2/15/96				

WESTON

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 46LLC014 SDG File Y/N: ____

Analyst: [illegible] Test: 8330 Method: Sonc Solvent: ACN AAPrep: ____

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L916-021	Air			10		100	2	N
2	022								
3	024								
4	026								
5	Blank								
6	BS					10			
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

[illegible] 2/8/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ____

End time: ____

BN Fraction (Date/Time/Initials)

Start time: ____

End time: ____

Extraction Information (Date/Analyst)

Filtration: ____

Boildown: ____

Blowdown: ____

GPC Ready: ____

GPC Cleanup: ____

GPC #: ____

After GPC Boildown: ____

After GPC Blowdown: ____

Acid/Florisil/Alumina Cleanup: ____

Prep Sheet: [illegible] 2/8/96

GPC Lab ID #: ____

Florisil Lot #: ____

Florisil Lab ID #: ____

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Composite XAD + filter for the above numbered RFW. See COC for original sample ID. [illegible] 2/7/96

ON: 1550 2/7/96

OFF: 0950 2/8/96 [illegible]

Surrogate: 40 uL 4102074W 1,2DNB @ 1000 ug/mL Spike: 1.25 mL 4611298 [illegible] 2/7/96 Witness: ____

This Page Reviewed By/Date: [illegible] 2/9/96 Reviewed Against LIMS By/DATE: [illegible] 2/15/96

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/07/96   Extraction Batch No: 96LLC014   Analyst: CS   Method: ****

Test: 0833   Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/08/96   Solvent: ACN   Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solid	C/D FACTOR
9602L916-	COE-HOT GAS										
021 0	AFTOUT-EXP/SV-R1-FX	7		10.0		100		2.0	N		200.0
022 0	IN/OUT-EXP/SV-SB-FX	7		10.0		100		2.0	N		200.0
024 0	AFTIN-EXP-R1-FX	7		10.0		100		2.0	N		200.0
026 0	AFTIN-EXP-R1MS-FX	7		10.0		100		2.0	N		200.0
96LLC014-MB1 0		7		10.0		100		2.0	N		200.0
96LLC014-MB1 0S		7		10.0	10	100		2.0	N		200.0

Comments: XAD + FILTER SONC 18 HRS W/100mL ACN
Surrogate: 40 uL 41020710 1,2-DNB @ 1000 ug/mL
Spike: 1.25 mL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
	N/A	C 2/7/96			

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LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LLC017 SDG File Y/N: ______

Analyst: G. Leinweber Test: 08330 Method: KD Solvent: ACN AAPrep: 2/8/96

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-006	Sdo		370	1		10	2	N
2	-020			210					
3	-023			240					
4	-025			220					
5	96021963-026			240					
6	-028			210					
7	-030			180					
8	-032			235					
9	-034			325					
10	Blank			200					
11	Blank spike			200		1			
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

G. Leinweber 2/9/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ______

End time: ______

BN Fraction (Date/Time/Initials)

Start time: ______

End time: ______

Extraction Information

(Date/Analyst)

Filtration: ______

Boildown: ______

Blowdown: ______

GPC Ready: ______

GPC Cleanup: ______

GPC #: ______

After GPC Boildown: ______

After GPC Blowdown: ______

Acid/Florisil/Alumina Cleanup: ______

Prep Sheet: 2/9/96 GL

GPC Lab ID #: ______

Florisil Lot #: ______

Florisil Lab ID #: ______

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: DCM/ACETONE 50:50 used for B + BS

All initial volumes to be logged in as 1 for total ug.

Water in all samples requiring Sodium Sulfate filtering

Surrogate: 50uL 4102410 1,2DNB Spike: 461129B 125uL Witness: ______

This Page Reviewed By/Date: [signature] 2/12/96 Reviewed Against LIMS By/DATE: [signature] 2/12/96

RFW 21-21-019/Z-11/93

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96 Extraction Batch No: 96LLC017 Analyst: GL Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/09/96 Solvent: DCM/ACETONE TO ACN Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
006 0	IN/OUT-EXP/SV-SB-ACE	7	1	1.0		10		2.0	N	0.0	20.0
020 0	AFTOUT-EXP/SV-R1-FB	7	1	1.0		10		2.0	N	0.0	20.0
023 0	AFTIN-EXP-R1-FB	7	1	1.0		10		2.0	N		20.0
025 0	AFTIN-EXP-R1MS-FB	7	1	1.0		10		2.0	N		20.0
9602L963-	COE-HOT GAS										
026 0	AFTOUT-EXPLSV-R2-FB	7	1	1.0		10		2.0	N		20.0
028 0	AFTOUT-EXPLSV-R3-FB	7	1	1.0		10		2.0	N		20.0
030 0	AFTOUT-EXPLSV-BT-FB	7	1	1.0		10		2.0	N		20.0
032 0	AFTIN-EXP-R2-FB	7	1	1.0		10		2.0	N	0.0	20.0
034 0	AFTIN-EXP-R3-FB	7	1	1.0		10		2.0	N	0.0	20.0
96LLC017-MB1 0	BLK	7	1	1.0		10		2.0	N		20.0
96LLC017-MB1 0S	BLK	7	1	1.0	1.0	10		2.0	N		20.0

Comments: ALL REQUIRED FILTRATION THROGH SODIUM SULFATE
Surrogate: 50UL 41024101 1,2-DNB
Spike: 125UL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
N/A					

GL 2/9/96

WESTON

Other/Miscellaneous

End of Data Package

EXPLOSIVES: COMPLETE SDG FILE (CSF) INVENTORY SHEET

LABORATORY NAME:	Roy F. Weston, Inc., Analytics Division
CITY/STATE:	Lionville, PA
CASE/SDG NO.:	9206L963
CLIENT NAME:	COE-Hot Gas
WORK ORDER NO.:	02281-012-012-1200
METHOD BASED ON:	SW8330 -Explosives By HPLC

All documents in the Client's copy of the complete SDG file must be legible, clearly labeled, paginated, single-sided original documents; or of sufficient copy quality to be reproducible to fourth generation copies. (Purge file documents, e.g., original-copy chain-of-custody, etc. assembled per specific contract request only.)

	CLIENT: SDG No.:	Page Nos From	To	Check (initials/date) Lab	Client
1	Cover Page (Lab Chron)	1	2	JD 2-23-96	
2	Table of Contents	3	3		
3	Case Narrative	4	9		
4	Shipping, Receiving, and Custody Records	10	14		
	• Lab Chain of Custody/Work Request			JD 2-23-96	
	• Client Custody Reports/Packing Lists			NA	
	• Sample Tags, if applicable			JD 2-23-96	
	• Airbills				
5	Explosives Sample Data/QC Summary	15	25		
	• Data Summary (LIMS Summary Report)			2/20/96	
	• Surrogate %Recovery Summary (Form II)			2/20/96	
	• MS/MSD Summary (Form III)			NA	
	• BS/BSD Summary (Form III)			2/20/96	
	• Method Blank Summary (Form IV)			2/20/96	
6	Sample Data, for each Sample:	26	110		
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, Primary column			2/20/96	
	• Chromatograms/Quant Reports, Confirmation column			2/20/96	
7	Calibration Standard Data	111	193		
	Primary Column Standards Data	112			
	• Initial Multi-Range Calibration: Chromatograms/Quant Reports			2/20/96	
	• Daily Calibration:				
	Initial: Chromatograms/Quant Reports			2/20/96	
	Continuing: Chromatograms/Quant Reports			2/20/96	
	Confirmation Column Standards Data		193		
	• Initial Multi-Range Calibration: Chromatograms/Quant Reports			2/20/96	
	• Daily Calibration:				

CLIENT: COE - Hot Gas SDG No.: 96C2L963		Page Nos From	To	Check (initials/date) Lab	Client
	Initial: Chromatograms/Quant Reports			2/20/96	
	Continuing: Chromatograms/Quant Reports			2/20/96	
8	Raw QC Data: Blank and Matrix Spike Data	194	212		
	Method Blank Data	195	212		
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, primary column			2/20/96	
	• Chromatograms/Quant Reports, confirmation column			N/A	
	Blank Spike/Blank Spike Duplicate				
	• Explosive Results (Form I)			2/20/96	
	• Chromatograms/Quant Reports, primary column			2/20/96	
	Matrix Spike/Matrix Spike Duplicate	NA	—		
	• Explosive Results (Form I)			N/A	
	• Chromatograms/Quant Reports, primary column			N/A	
9	Analysis Logbook Pages	213	224	2/20/96	
10	Standards Preparation Records	225	232		
	• Surrogate and Target Analyte Spike Solutions			2/20/96	
	• Analysis Standards			2/20/96	
11	Preparation Logs	233	239		
	• Sample Prep (Extraction) Records			2/20/96	
12	Other/Miscellaneous	NA(240)			
				NA 2-23-96	

COMMENTS:

Checked by: (Laboratory) Signature: [signature] Printed Name/Title: Jinie Driscoll / Data Report Coordinator Date: 2-23-96

Checked by: (Client) Signature ______ Printed Name/Title ______ Date ______

Cover Page (Lab Chron)

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96 RFW LOT # :9602L963

CLIENT ID	RFW #		MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-EXPLSV-R2COMP	004		AI	96LLC015	02/02/96	02/08/96	02/09/96
AFTOUT-EXPLSV-R3COND	009		AI	96LLC015	02/04/96	02/08/96	02/08/96
AFTOUT-EXPLSV-BTCOND	014		AI	96LLC015	02/04/96	02/08/96	02/09/96
AFTIN-EXP-R2-COND	019		AI	96LLC015	02/02/96	02/08/96	02/08/96
AFTIN-EXP-R2-COND	019	01	AI		02/02/96	02/08/96	02/08/96
AFTIN-EXP-R3-COND	024		AI	96LLC015	02/04/96	02/08/96	02/08/96
AFTIN-EXP-R3-COND	024	01	AI		02/04/96	02/08/96	02/08/96
AFTOUT-EXPLSV-R2-FB	026		AI	96LLC017	02/02/96	02/08/96	02/09/96
AFTOUT-EXPLSV-R2-FX	027		AI	96LLC016	02/02/96	02/08/96	02/09/96
AFTOUT-EXPLSV-R3-FB	028		AI	96LLC017	02/04/96	02/08/96	02/09/96
AFTOUT-EXPLSV-R3-FX	029		AI	96LLC016	02/04/96	02/08/96	02/09/96
AFTOUT-EXPLSV-BT-FB	030		AI	96LLC017	02/04/96	02/08/96	02/08/96
AFTOUT-EXPLSV-BT-FX	031		AI	96LLC016	02/04/96	02/08/96	02/09/96
AFTIN-EXP-R2-FB	032		AI	96LLC017	02/02/96	02/08/96	02/08/96
AFTIN-EXP-R2-FX	033		AI	96LLC016	02/02/96	02/08/96	02/09/96
AFTIN-EXP-R2-FX	033	01	AI		02/02/96	02/08/96	02/09/96
AFTIN-EXP-R3-FB	034		AI	96LLC017	02/04/96	02/08/96	02/09/96
AFTIN-EXP-R3-FX	035		AI	96LLC016	02/04/96	02/08/96	02/09/96
AFTIN-EXP-R3-FX	035	01	AI		02/04/96	02/08/96	02/09/96
AFTIN-EXP-R3-FX	035	02	AI		02/04/96	02/08/96	02/09/96

LAB QC:

BLK	MB1		AI	96LLC015	N/A	02/08/96	02/08/96
BLK	MB1	BS	AI	96LLC015	N/A	02/08/96	02/08/96
BLK	MB1		AI	96LLC017	N/A	02/08/96	02/09/96
BLK	MB1	BS	AI	96LLC017	N/A	02/08/96	02/09/96
BLK	MB1		AI	96LLC016	N/A	02/08/96	02/09/96
BLK	MB1	BS	AI	96LLC016	N/A	02/08/96	02/09/96

WESTON

TABLE OF CONTENTS

EXPLOSIVES

t390.jkd

WESTON

Case Narrative

WESTON
MANAGERS DESIGNERS/CONSULTANTS
Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW# : 9602L963

W.O :02281-012-012-1200-00
Date Received: 07 February 1996

EXPLOSIVE

1. The set of samples consisted of five (5) air samples which were collected on 02,04 February 1996. Each sampling train consisted of three fractions: condensate, solid (filter / XAD), and solvent; each fraction has been analyzed and reported individually.

2. The samples and their associated QC samples were prepared on 08 February 1996 and analyzed by methodology based on EPA method 8330 on 08,09 February 1996.

3. The sample ID's for this set of samples were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters on Organic CLP forms.

4. All required holding times for extraction and analysis were met.

5. All initial calibrations associated with this data set were within acceptance criteria.

6. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

7. Laboratory control limits were not available for assessing surrogate and spike recoveries for the procedures used to prepare these samples.

8. Laboratory control limits were not available for air matrices. However, samples AFTOUT-EXPLSV-R3COND and AFTOUT-EXPLSV-BTCOND exhibited surrogate recoveries outside the laboratory control limits for water samples, which are applicable in this case. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

9. Tetryl was not recovered from the blank spike (96LLC017-MB1 BS) associated with the solvent matrix.

10. The Tetryl recovery from blank spike (96LLC016-MB1 BS) associated with solid matrix was relatively low.

WESTON MANAGERS DESIGNERS CONSULTANTS

11. All samples associated with 'AFTIN' (afterburner inlet) required dilution due to the presence of high levels of target analytes.

12. The following solvent samples required two-fold dilutions due to immiscibility with acetonitrile:

    1. AFTOUT-EXPLSV-R2-FB
    2. AFTOUT-EXPLSV-R3-FB
    3. 96LLC017-MB1
    4. 96LLC017-MB1 BS

Bruce C. Myllis unit lindu — 2-23-96

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

Date

cs/jkd/misc/02-963.ex

WESTON.

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP	=	Indicates spiked compound.

WESTON Sample Discrepancy Report (SDR) SDR #: 96AM0098

Initiator: K. Baker RFW Batch: 9602L916, 963 Parameter: All
Date: 2-14-96 Samples: All Matrix: Air
Client: AAAP Hot Gas Method: SW846/MCAWW/CLP Prep Batch: ______

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C.
__ Transcription Error __ Wrong Test Code X Other Wrong matrix

b. General Discrepancy
__ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

c. QC Problem (Include all relevant specific results; attach data if necessary)

ALL matrices should be air.
please change all samples listed as water to air.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: ______
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ______
__ Place On/Take Off Hold (circle)

Other Description:
X change matrix where appropriate to air.

4. Project Manager Instructions...signature/date: K Baker 2/14/96
X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person ______
__ Add
__ Cancel

5. Final Action...signature/date: [illegible] 2/15/96 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr: ______	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ______

WESTON® Sample Discrepancy Report (SDR)

SDR #: 96LC006

Initiator:	C. Schnell	RFW Batch:	9602L963	Parameter:	~~Air (H2O)~~ 8330
Date:	2/12/96	Samples:	009, 014	Matrix:	Air (H2O)
Client:	CE - Hot Gas	Method:	SW846/MCAWW/CLP/	Prep Batch:	

1. Reason for SDR

a. COC Discrepancy ___ Tech Profile Error ___ Client Request ___ Sampler Error on C-O-C
___ Transcription Error ___ Wrong Test Code ___ Other ______

b. General Discrepancy
___ Missing Sample/Extract* ___ Container Broken ___ Wrong Sample Pulled ___ Label ID's Illegible
___ Hold Time Exceeded ___ Insufficient Sample* ___ Preservation Wrong ___ Received Past Hold
___ Improper Bottle Type ___ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

c. QC Problem (Include all relevant specific results; attach data if necessary)

low surrogate recoveries. ~~for~~ Sample 963-009 → 36%; Sample 963-014 → 0%

2. Known or Probable Causes(s)

963-009 - unknown
963-014 - large volume of ACN present after 1st RSOE step, which may be an indication something may have been present in the sample which interfered with ACN/salt water equilibrium.

3. Discussion and Proposed Action

___ Re-log
___ Entire Batch
___ Following Samples: ______
___ Re-leach
___ Re-extract
___ Re-digest
___ Revise EDD
___ Change Test Code to ______
___ Place On/Take Off Hold (circle)

Other Description:
963-009: despite low recovery, reporting limits are much below action levels for the project.
963-014: Condensate from blank sampling train. Other fractions of 'GT' clean.

4. Project Manager Instructions...signature/date: K Baker 2/19/96
___ Concur with Proposed Action
___ Disagree with Proposed Action; See Instruction
X Include in Case Narrative
___ Client Contacted:
Date/Person ______
___ Add
___ Cancel

5. Final Action...signature/date: [signature] 2/20/96
___ Verified re-[log][leach][extract][digest][analysis] (circle)
✓ Included in Case Narrative
___ Hard Copy COC Revised
___ Electronic COC Revised
___ EDD Corrections Completed

Other Explanation:

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
___	X Initiator	___	___ Metals: Reichner/Doughty
___	X Lab Manager: J. Michael Taylor	___	___ Inorganic: Perrone/Leonards
1	X Project Mgr: K Baker / T Daniels	___	___ GC/LC: Jarvis/Skrzat/Schnell
___	X Section Mgr: Siery/Durke/Daniels	___	___ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
___	X QA Section Mgr: Dianne Therry	___	___ Log-in: Geiger
___	X QA File: Feldman/Racioppi/Shaffer	___	___ EDD: Miller
___	X Data Reporting: Som Basuthakur	___	___ Admin: Brewer/Keehn/Edgington
___	___ Sample Prep: Osei-Mensah/Swisher	___	___ Other: ______

WESTON

Shipping, Receiving, and Custody Record

9602L963 (custody and billing, make Data Billing, Extracts)

WESTON Analytics Use Only
9602L963 2/7/96

Custody Transfer Record/Lab Work Request

Explosives - AFT OUTLET

WESTON

Page 1 of 2

Client COE-HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # J. O'Neill X7201
AD Project Manager J. Baker
QC SDD
Date Rec'd 2/7/96 Date Due 2/14/96
Account # COEHOTGAS

Refrigerator #	
#/Type Container	Liquid / Solid
Volume	Liquid / Solid
Preservatives	
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330*	8330	Semivolatiles EPA 8270**	
1	COE-HG-AFTOUT-EXPL-R2-EHS			Air	2/2/96		X		X	Run 2
2	COE-HG-AFTOUT-EXPL-R2-FLT				↓		X		X	
3	COE-HG-AFTOUT-EXPL-R2-XAD						X		X	
4	COE-HG-AFTOUT-EXPL-R2-COND			Water			X 9/27/96	✓	X	
5	COE-HG-AFTOUT-EXPL-R2-BHS			Air	↓		X		X	
6	COE-HG-AFTOUT-EXPL-R3-FHS				2/4/96		X		X	Run 3
7	COE-HG-AFTOUT-EXPL-R3-FLT						X		X	
8	COE-HG-AFTOUT-EXPL-R3-XAD						X		X	
9	COE-HG-AFTOUT-EXPL-R3-COND			Air			X 9/27/96	✓	X	
10	COE-HG-AFTOUT-EXPL-R3-BHS			Air	↓		X		X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
* RDX; HMX; tetryl;
2,4-DNT; 2,6-DNT;
NB; 1,3-DNB; 1,3,5-TNB
2,4,6-TNT

DATE/REVISIONS:
1. ** Analyze 1 of 3
2. tests for lower
3. carbon number semivolatiles
4. using EPA 8015.
5. Select highest explosive
6. extract and analyze

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S. D. Cook	B. Richards	2/7/96	15:40				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped X or Hand Delivered
Airbill #
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

See pg. 2 for revisions

Explosives - AFT Outlet

Custody Transfer Record/Lab Work Request

WESTON Analytics Use Only: 9602L963

WESTON — Page 2 of 2

2084

Client	COE - HOT GAS
Est. Final Proj. Sampling Date	
Work Order #	02281-012-012-1200
Project Contact/Phone #	J. O'Neill x7201
AD Project Manager	K. Baker
QC	500
Del	500
TAT	
Date Rec'd	
Date Due	
Account #	

Refrigerator #	
#/Type Container — Liquid	
#/Type Container — Solid	
Volume — Liquid	
Volume — Solid	
Preservatives	
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

WESTON Analytics Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330*	Semi Volatiles EPA 8270	EPA 5015
011	COE-HG-AFTOUT-EN/SV-BT-FHS			Air	2/4/96		X	X	X
12	COE-HG-AFTOUT-EN/SV-BT-FLT				↓		X	X	X
13	COE-HG-AFTOUT-EN/SV-BT-XAD			Air			X	X	X
14	COE-HG-AFTOUT-EN/SV-BT-COND			Air			X 2/7/96	X	X
15	COE-HG-AFTOUT-EN/SV-BT-BHS			Air	↓		X	X	X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

* RDX; HMX; tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB 2,4,6-TNT

DATE/REVISIONS:

1. Analyze BT for
2. 8015 Semi Volatiles
3. 8015 to be logged as a
4. later date
5. 2/10/96 Cancelled 0625 then #19,024
6. per SDR# 96PM0089

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S.D. [illegible]	J. Buchanan	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

2/14/96 ~~All~~ matrix's on all samples are Air ~~per snort~~ [illegible] 2/14/96

9602L963

Explosives - AFT INLET

WESTON Analytics Use Only: 9602L963 2/7/96

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1 2/7/96

013

Client COE-HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # J. ONeill X7201
AD Project Manager K. Baker
QC STD Del STD TAT
Date Rec'd ______ Date Due ______
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED →: ORGANIC (VOA, BNA, Pest/PCB, Herb); Comp; INORG (Metal, CN)

WESTON Analytics Use Only: Explosives EPA 8330*; Semi vol. 8015 * *

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Explosives EPA 8330*	Semi vol. 8015	
016	COE-H6-AFTIN-EXP-R2-FHS				2/2/96						X	X	
17	COE-H6-AFTIN-EXP-R2-FILT										X	X	RUN 2
18	COE-H6-AFTIN-EXP-R2-XAD										X	X	
19	COE-H6-AFTIN-EXP-R2-COND						✓	✓				X	
20	COE-H6-AFTIN-EXP-R2-BHS										X	X	
21	COE-H6-AFTIN-EXP-R3-FHS				2/4/96						X	X	
22	COE-H6-AFTIN-EXP-R3-FILT										X	X	Run 3
23	COE-H6-AFTIN-EXP-R3-XAD										X	X	
24	COE-H6-AFTIN-EXP-R3-COND						✓	✓				X	
25	COE-H6-AFTIN-EXP-R3-BHS										^		

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
* RDX; HMX; tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB 2,4,6-TNT

DATE/REVISIONS:
1. ** Analyze 1 of 3
2. 1st runs for
3. lower carbon number
4. semi volatiles via
5. EPA 8015 - select run
6. based on highest 8330 values

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Todd	Richardson	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only
Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381-596a

WESTON Analytics Use Only
9602L963

Custody Transfer Record/Lab Work Request

WESTON

Client COE-Hot GAS
Est. Final Proj. Sampling Date
Work Order #
Project Contact/Phone #
AD Project Manager
QC
TAT
Date Rec'd
Date Due
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA 0625	Pest/PCB	Herb	8833						Comp#
26	AFTOUT-EXP/SV-R2-FB			Air	2/2/96			✓			✓						001 + 005
27	AFTOUT-EXP/SV-R2-FX																002 + 003
28	AFTOUT-EXP/SV-R3-FB				2/4/96												006 + 010
29	AFTOUT-EXP/SV-R3-FX																007 + 008
30	AFTOUT-EXP/SV-~~R3-FB~~ BT-FB				2/4/96												011 + 015
31	AFTOUT-EXP/SV-~~R3-FX~~ BT-FX																012 + 013
32	AFTIN-EXP-R2-FB				2/2/96			✓			✓						016 + 020
33	AFTIN-EXP-R2-FX							✓									017 + 018
34	AFTIN-EXP-R3-FB				2/4/96			✓									021 + 025
35	AFTIN-EXP-R3-FX							✓									022 + 023

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

FB = FHS + BHS Composite
FX = FILT + XAD COMP

DATE/REVISIONS:
2/12/96 1. 625 Added to 019, 024, 032, 033, 034 + 035
2. per 96PM0090
2/14/96 3. All Matrix = Air per 95PM0098
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fold	Pflegen	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

Explosive Sample QC/Data Summary

Roy F. Weston, Inc. - Lionville Laboratory
Explosives by HPLC / Method 8330

RFW Batch Number: 9602L963   Client: COE-HOT GAS   Work Order: 02281-012-012-1200-00   Report Date: 02/15/96 20:23   Page: 1

0210

	Cust ID:	AFTOUT-EXPLS V-R2COMP	fl	AFTOUT-EXPLS V-R3COND	fl	AFTOUT-EXPLS V-BTCOND	fl	AFTIN-EXP-R2 -COND	fl	AFTIN-EXP-R2 -COND	fl	AFTIN-EXP-R3 -COND	fl
Sample	RFW#:	004		009		014		019		019 DL		024	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		100		10000		100	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	75	%	36	%	0 *	%	D	%	D	%	D	%
HMX		2.2	U	2.2	U	2.2	U	220	U	22000	U	220	U
RDX		1.0	U	1.0	U	1.0	U	2000		10000	U	330	
1,3,5-Trinitrobenzene		0.50	U	0.50	U	0.50	U	480		5000	U	170	
1,3-Dinitrobenzene		0.52	U	0.52	U	0.52	U	52	U	5200	U	52	U
Nitrobenzene		0.52	U	0.52	U	0.52	U	52	U	5200	U	52	U
Tetryl		1.5	U	1.5	U	1.5	U	190		15000	U	54	
2,4,6-Trinitrotoluene		0.50	U	0.50	U	0.50	U	7200	E	7000		6000	E
2,6-Dinitrotoluene		0.50	U	0.50	U	0.50	U	50	U	5000	U	50	U
2,4-Dinitrotoluene		0.50	U	0.50	U	0.50	U	50	U	5000	U	50	U

	Cust ID:	AFTIN-EXP-R3 -COND	fl	AFTOUT-EXPLS V-R2-FB	fl	AFTOUT-EXPLS V-R2-FX	fl	AFTOUT-EXPLS V-R3-FB	fl	AFTOUT-EXPLS V-R3-FX	fl	AFTOUT-EXPLS V-BT-FB	fl
Sample	RFW#:	024 DL		026		027		028		029		030	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	5000		2.00		1.00		2.00		1.00		1.00	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	D	%	56	%	70	%	72	%	68	%	68	%
HMX		11000	U	4.4	U	22	U	4.4	U	22	U	2.2	U
RDX		5000	U	2.0	U	10	U	2.0	U	10	U	1.0	U
1,3,5-Trinitrobenzene		2500	U	1.0	U	5.0	U	1.0	U	5.0	U	0.50	U
1,3-Dinitrobenzene		2600	U	1.0	U	5.2	U	1.0	U	5.2	U	0.52	U
Nitrobenzene		2600	U	1.0	U	5.2	U	1.0	U	5.2	U	0.52	U
Tetryl		7300	U	2.9	U	15	U	2.9	U	15	U	1.5	U
2,4,6-Trinitrotoluene		6300		1.0	U	5.0	U	1.0	U	5.0	U	0.50	U
2,6-Dinitrotoluene		2500	U	1.0	U	5.0	U	1.0	U	5.0	U	0.50	U
2,4-Dinitrotoluene		2500	U	1.0	U	5.0	U	1.0	U	5.0	U	0.50	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Roy F. Weston, Inc. - Lionville Laboratory

Explosives by HPLC / Method 8330

RFW Batch Number: 9602L963 | Client: COE-HOT GAS | Report Date: 02/15/96 20:23 | Work Order: 02281-012-012-1200-00 | Page: 2

Sample Information	Cust ID:	AFTOUT-EXPLS V-BT-FX		AFTIN-EXP-R2 -FB		AFTIN-EXP-R2 -FX		AFTIN-EXP-R2 -FX		AFTIN-EXP-R3 -FB		AFTIN-EXP-R3 -FX	
	RFW#:	031		032		033		033 DL		034		035	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		100		1.00		100		100		1.00	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	75	%	D	%	126	%	D	%	D	%	I	%
			fl		fl		fl		fl		fl		fl
HMX		22	U	220	U	22	U	2200	U	220	U	22	U
RDX		10	U	760		120		1000	U	230		470	E
1,3,5-Trinitrobenzene		5.0	U	39		60		500	U	23		250	E
1,3-Dinitrobenzene		5.2	U	52	U	9.4		520	U	52	U	23	
Nitrobenzene		5.2	U	52	U	5.2	U	520	U	52	U	5.2	U
Tetryl		15	U	150	U	15		1500	U	150	U	70	
2,4,6-Trinitrotoluene		5.0	U	920		2300	E	2500		960		2500	E
2,6-Dinitrotoluene		5.0	U	50	U	21		500	U	50	U	5.0	U
2,4-Dinitrotoluene		5.0	U	50	U	5.0	U	500	U	50	U	5.0	U

Sample Information	Cust ID:	AFTIN-EXP-R3 -FX		AFTIN-EXP-R3 -FX		BLK		BLK BS		BLK		BLK BS	
	RFW#:	035 DL		035 DL		96LLC015-MB1		96LLC015-MB1		96LLC017-MB1		96LLC017-MB1	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	10.0		100		1.00		1.00		2.00		2.00	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	D	%	D	%	71	%	73	%	45	%	26	%
			fl		fl		fl		fl		fl		fl
HMX		220	U	2200	U	2.2	U	68	%	4.4	U	18	%
RDX		610		1000	U	1.0	U	62	%	2.0	U	29	%
1,3,5-Trinitrobenzene		290		500	U	0.50	U	79	%	1.0	U	21	%
1,3-Dinitrobenzene		52	U	520	U	0.52	U	73	%	1.0	U	27	%
Nitrobenzene		52	U	520	U	0.52	U	77	%	1.0	U	36	%
Tetryl		150	U	1500	U	1.5	U	94	%	2.9	U	O *	%
2,4,6-Trinitrotoluene		2800	E	2700	~~D~~	0.50	U	85	%	1.0	U	13	%
2,6-Dinitrotoluene		50	U	500	U	0.50	U	80	%	1.0	U	23	%
2,4-Dinitrotoluene		50	U	500	U	0.50	U	79	%	1.0	U	21	%

2/15/96

02/23/96

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Roy F. Weston, Inc. - Lionville Laboratory
Explosives by HPLC / Method 8330

Report Date: 02/15/96 20:23

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281-012-012-1200-00

	Cust ID:	BLK		BLK BS	
Sample Information	RFW#:	96LLC016-MB1		96LLC016-MB1	
	Matrix:	AIR		AIR	
	D.F.:	1.00		1.00	
	Units:	total ug		total ug	
Surrogate:	1,2-Dinitrobenzene	80	%	78	%
HMX		22	U	75	%
RDX		10	U	70	%
1,3,5-Trinitrobenzene		5.0	U	58	%
1,3-Dinitrobenzene		5.2	U	82	%
Nitrobenzene		5.2	U	85	%
Tetryl		15	U	19	%
2,4,6-Trinitrotoluene		5.0	U	78	%
2,6-Dinitrotoluene		5.0	U	87	%
2,4-Dinitrotoluene		5.0	U	87	%

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

gmD 2/15/96

2F

~~SOIL~~ ORGANICS SURROGATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot No.: 9602L963

GC Column(1): OD5/DA ID: OD5/ (mm) GC Column(2): ID: ____ (mm)

	CLIENT SAMPLE NO.	1 %REC #	2 %REC #	1 %REC #	2 %REC #	1 %REC #	2 %REC #	TOT OUT
01	AFTOUT-EXPLSV-R2COMP	75						0
02	AFTOUT-EXPLSV-R3COND	36						0
03	AFTOUT-EXPLSV-BTCOND	0 *						1
04	AFTIN-EXP-R2-COND	D						0
05	AFTIN-EXP-R2-COND	D						0
06	AFTIN-EXP-R3-COND	D						0
07	AFTIN-EXP-R3-COND	D						0
08	AFTOUT-EXPLSV-R2-FB	56						0
09	AFTOUT-EXPLSV-R2-FX	70						0
10	AFTOUT-EXPLSV-R3-FB	72						0
11	AFTOUT-EXPLSV-R3-FX	68						0
12	AFTOUT-EXPLSV-BT-FB	68						0
13	AFTOUT-EXPLSV-BT-FX	75						0
14	AFTIN-EXP-R2-FB	D						0
15	AFTIN-EXP-R2-FX	126						0
16	AFTIN-EXP-R2-FX	D						0
17	AFTIN-EXP-R3-FB	D						0
18	AFTIN-EXP-R3-FX	I						0
19	AFTIN-EXP-R3-FX	D						0
20	AFTIN-EXP-R3-FX	D						0
21	BLK	71						0
22	BLKBS	73						0
23	BLK	45						0
24	BLKBS	26						0
25	BLK	80						0
26	BLKBS	78						0

= 1,2-Dinitrobenzene

ADVISORY
QC LIMITS
(1-999)

\# Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

Control Limits Are Not ~~At~~ AVAILABLE

gmD 2/15/96

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client : COE-HOT GAS RFW Lot No.: 96LLC015-MB1

BLANK Spike - Sample No.: BLK

MP 2/15/96

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	22.0	0	15	68	1-999
RDX	10.0	0	6.2	62	1-999
1,3,5-Trinitrobenzene	2.50	0	2.0	79	1-999
1,3-Dinitrobenzene	2.50	0	1.8	73	1-999
Nitrobenzene	2.60	0	2.0	77	1-999
Tetryl	6.50	0	6.1	94	1-999
2,4,6-Trinitrotoluene	2.50	0	2.1	85	1-999
2,6-Dinitrotoluene	2.60	0	2.1	80	1-999
2,4-Dinitrotoluene	2.50	0	2.0	79	1-999

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 9 outside limits

COMMENTS: Control Limits are not available

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Client : COE-HOT GAS   RFW Lot No.: 96LLC017-MB1

BLANK Spike - Sample No.: BLK

JKD 2/15/96

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	22.0	0	4.0	18	1-999
RDX	10.0	0	2.9	29	1-999
1,3,5-Trinitrobenzene	2.50	0	0.52	21	1-999
1,3-Dinitrobenzene	2.50	0	0.68	27	1-999
Nitrobenzene	2.60	0	0.94	36	1-999
Tetryl	6.50	0	0	Ø *	1-999
2,4,6-Trinitrotoluene	2.50	0	0.32	13	1-999
2,6-Dinitrotoluene	2.60	0	0.60	23	1-999
2,4-Dinitrotoluene	2.50	0	0.52	21	1-999

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 1 out of 9 outside limits

COMMENTS: Control Limits are not available

3F

AIR ORGANICS BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client : COE-HOT GAS RFW Lot No.: 96LLC016-MB1

BLANK Spike - Sample No.: BLK

XUD 2/15/96

COMPOUND	SPIKE ADDED (tot. ~~ng~~ µg)	SAMPLE CONCENTRATION (tot. ~~ng~~ µg)	BS CONCENTRATION (tot. ~~ng~~ µg)	BS % REC #	QC LIMITS REC.
HMX	220	0	170	75	1-999
RDX	100	0	70	70	1-999
1,3,5-Trinitrobenzene	25.0	0	15	58	1-999
1,3-Dinitrobenzene	25.0	0	20	82	1-999
Nitrobenzene	26.0	0	22	85	1-999
Tetryl	65.0	0	12	19	1-999
2,4,6-Trinitrotoluene	25.0	0	19	78	1-999
2,6-Dinitrotoluene	26.0	0	23	87	1-999
2,4-Dinitrotoluene	25.0	0	22	87	1-999

Column to be used to flag recovery value with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 9 outside limits

COMMENTS: Control Limits are not available

4C

ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC015-MB1 Lab File ID: 02089646.19

Matrix:(soil/water) AIR Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _ Date Extracted: 02/08/96

Date Analyzed (1): 02/08/96 Date Analyzed (2): ________

Time Analyzed (1): 1658 Time Analyzed (2): ____

Instrument ID (1): 46 Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/ (mm) GC Column (2): ID: ____ (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	AFTOUT-EXPLS	9602L963-004	02/09/96	
02	AFTOUT-EXPLS	9602L963-009	02/08/96	
03	AFTOUT-EXPLS	9602L963-014	02/09/96	
04	AFTIN-EXP-R2	9602L963-019	02/08/96	
05	AFTIN-EXP-R2	9602L963-019	02/08/96	
06	AFTIN-EXP-R3	9602L963-024	02/08/96	
07	AFTIN-EXP-R3	9602L963-024	02/08/96	
08	BLKBS	96LLC015-MB1S	02/08/96	

COMMENTS: ________________________________

4C

ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC017-MB1 Lab File ID: 02099646.16

Matrix:(soil/water) AIR Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _ Date Extracted: 02/08/96

Date Analyzed (1): 02/09/96 Date Analyzed (2): ________

Time Analyzed (1): 1351 Time Analyzed (2): ____

Instrument ID (1): 46 Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/ (mm) GC Column (2): ID: ____ (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	AFTOUT-EXPLS	9602L963-026	02/09/96	
02	AFTOUT-EXPLS	9602L963-028	02/09/96	
03	AFTOUT-EXPLS	9602L963-030	02/08/96	
04	AFTIN-EXP-R2	9602L963-032	02/08/96	
05	AFTIN-EXP-R3	9602L963-034	02/09/96	
06	BLKBS	96LLC017-MB1S	02/09/96	

COMMENTS: ______________________

2/12/96

4C
ORGANICS METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

BLK

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Client: COE-HOT GAS

Lab Sample ID: 96LLC016-MB1 Lab File ID: 02099646.17

Matrix:(soil/water) AIR Extraction:(SepF/Cont/Sonc) SONC

Sulfur Cleanup: (Y/N) _ Date Extracted: 02/08/96

Date Analyzed (1): 02/09/96 Date Analyzed (2): ________

Time Analyzed (1): 1410 Time Analyzed (2): ____

Instrument ID (1): 46 Instrument ID (2):

GC Column (1): OD5/DA ID: OD5/(mm) GC Column (2): ID: ____(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	AFTOUT-EXPLS	9602L963-027	02/09/96	
02	AFTOUT-EXPLS	9602L963-029	02/09/96	
03	AFTOUT-EXPLS	9602L963-031	02/09/96	
04	AFTIN-EXP-R2	9602L963-033	02/09/96	
05	AFTIN-EXP-R2	9602L963-033	02/09/96	
06	AFTIN-EXP-R3	9602L963-035	02/09/96	
07	AFTIN-EXP-R3	9602L963-035	02/09/96	
08	AFTIN-EXP-R3	9602L963-035	02/09/96	
09	BLKBS	96LLC016-MB1S	02/09/96	

COMMENTS: ____

C 2/12/96

Analysis Run Logs

214

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: HPLC # 1
DETECTOR: HP 1050 DAD
WAVELENGTH: 254 nm
CALIBRATION STANDARD 461118

MOBILE PHASE: 54% H_2O, 32.7% MeOH, 13.2% ACN, 0.1% IPA @ 38°C
COLUMN TYPE: B+J ODS 25cm x 4.6mm
SPIKING STANDARD — 461129

ANALYST: G. Leinweber
FLOW RATE: 1.4 ml/min
COLUMN SERIAL #: 21856

					COMMENTS
01	01249646.01	RAW2:AO667551	01/24/96 16:23:23	STD 461118F	
02	01249646.02	RAW2:AO667554	01/24/96 16:43:07	STD 461118E	
03	01249646.03	RAW2:AO667557	01/24/96 17:02:54	STD 461118D	46124
04	01249646.04	RAW2:AO667560	01/24/96 17:22:36	STD 461118C	06330 Primary
05	01249646.05	RAW2:AO667569	01/24/96 17:42:17	STD 461118B	
06	01249646.06	RAW2:AO667572	01/24/96 18:02:00	STD 461118A	
07	01249646.07	RAW2:AO667577	01/24/96 18:21:40	OX	

G. Leinweber 1/31/96

G. Leinweber 1/31/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE [signature] 2/10/96

PAGE # 1

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HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See page 1 ANALYST: ______

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02089646.25		RAW2:B8673074		02/08/96 18:56:15	9602L963-024 5000		
26	02089646.26		RAW2:B8673078		02/08/96 19:15:53	9602L916-018D1		
27	02089646.27		RAW2:B8673083		02/08/96 19:35:30	IBLK		
28	02089646.28		RAW2:B8673091		02/08/96 19:55:11	STD 461118D		
29	02089646.29		RAW2:B8673099		02/08/96 20:14:46	9602L916-013D1 5000		
30	02089646.30		RAW2:B8673105		02/08/96 20:34:22	9602L963-019D1 100		
31	02089646.31		RAW2:B8673114		02/08/96 20:54:01	9602L963-024D1 100		
32	02089646.32		RAW2:B8673119		02/08/96 21:13:37	9602L916-024D1 100		
33	02089646.33		RAW2:B8673124		02/08/96 21:33:12	INST. BLANK		
34	02089646.34		RAW2:B8673131		02/08/96 21:52:48	9602L916-020		
35	02089646.35		RAW2:B8673138		02/08/96 22:12:24	9602L916-023 20000		
36	02089646.36		RAW2:B8673145		02/08/96 22:32:02	9602L963-030		
37	02089646.37		RAW2:B8673152		02/08/96 22:51:38	9602L963-032 5000		
38	02089646.38		RAW2:B8673155		02/08/96 23:11:14	9602L963-034 5000		
39	02089646.39		RAW2:B8673166		02/08/96 23:30:49	9602L963-032D1 100		
40	02089646.40		RAW2:B8673169		02/08/96 23:50:26	INST. BLANK		
41	02089646.41		RAW2:B9673178		02/09/96 00:10:07	STD 461118D		
42	02089646.42		RAW2:B9673183		02/09/96 00:29:45	9602L963-034D1 100		
43	02089646.43		RAW2:B9673190		02/09/96 00:49:20	INST. BLANK		
44	02089646.44		RAW2:B9673195		02/09/96 01:09:01	STD 461118D		

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. [illegible] 2/11/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See Page 1 ______ ANALYST: ______

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	Dilution	ID #	COMMENTS
01	02089646.01	RAW2:B8672894	02/08/96 11:05:02	STD 461118D			
02	02089646.02	RAW2:B8672922	02/08/96 11:24:42	STD 461118D			
03	02089646.03	RAW2:B8672928	02/08/96 11:44:23	STD 461118D			
04	02089646.04	RAW2:B8672932	02/08/96 12:04:01	96LLC013-MB1			
05	02089646.05	RAW2:B8672939	02/08/96 12:23:40	96LLC013-MB1S			
06	02089646.06	RAW2:B8672946	02/08/96 12:43:20	9602L916-004			
07	02089646.07	RAW2:B8672953	02/08/96 13:02:58	9602L916-009			
08	02089646.08	RAW2:B8672956	02/08/96 13:22:35	9602L916-018			
09	02089646.09	RAW2:B8672966	02/08/96 13:42:12	9602L916-013	100		
10	02089646.10	RAW2:B8672968	02/08/96 14:01:50	INST. BLANK			
11	02089646.11	RAW2:B8672978	02/08/96 14:21:30	96LLC014-MB1			
12	02089646.12	RAW2:B8672985	02/08/96 14:41:07	96LLC014-MB1S			
13	02089646.13	RAW2:B8672989	02/08/96 15:00:46	9602L916-021			
14	02089646.14	RAW2:B8672994	02/08/96 15:20:24	9602L916-022			
15	02089646.15	RAW2:B8673003	02/08/96 15:40:02	IBLK			
16	02089646.16	RAW2:B8673016	02/08/96 15:59:43	STD 461118D			
17	02089646.17	RAW2:B8673023	02/08/96 16:19:21	9602L916-024			
18	02089646.18	RAW2:B8673026	02/08/96 16:38:57	9602L916-026			
19	02089646.19	RAW2:B8673031	02/08/96 16:58:34	96LLC015-MB1			
20	02089646.20	RAW2:B8673040	02/08/96 17:18:11	96LLC015-MB1S		2/10/96	
21	02089646.21	RAW2:B8673045	02/08/96 17:37:50	9602L963-004			
22	02089646.22	RAW2:B8673053	02/08/96 17:57:28	9602L963-009			
23	02089646.23	RAW2:B8673063	02/08/96 18:17:03	9602L963-014			
24	02089646.24	RAW2:B8673067	02/08/96 18:36:39	9602L963-019	1000		

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweb 2/12/96

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HPLC ANALYSIS LOG

INSTRUMENT #: ____________ MOBILE PHASE: See Page 1 ____________ ANALYST: ____________

DETECTOR: ____________ ____________ FLOW RATE: ____________

WAVELENGTH: ____________ COLUMN TYPE: ____________ COLUMN SERIAL #: ____________

CALIBRATION STANDARD ____________ SPIKING STANDARD ____________

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	Dilution	T ID #	COMMENTS
01	02099646.01	RAW2:B9673290	02/09/96 08:56:39	STD 461118D			
02	02099646.02	RAW2:B9673299	02/09/96 09:16:19	STD 461118D			
03	02099646.03	RAW2:B9673300	02/09/96 09:35:59	STD 461118D			
04	02099646.04	RAW2:B9673307	02/09/96 09:55:39	9602L963-004			Autosampler position Sample ID 02/14/96
05	02099646.05	RAW2:B9673311	02/09/96 10:15:18	9602L963-009			09 96LLC017-MB1S
06	02099646.06	RAW2:B9673322	02/09/96 10:34:57	9602L963-014			
07	02099646.07	RAW2:B9673324	02/09/96 10:54:36	9602L916-023D1	100		10 9602L916-006
08	02099646.08	RAW2:B9673331	02/09/96 11:14:13	96LLC014-MB1S			11 9602L916-025
09	02099646.09	RAW2:B9673337	02/09/96 11:33:51	96LLC017-MB1			
10	02099646.10	RAW2:B9673341	02/09/96 11:53:30	96LLC017-MB1S	2		12 9602L963-026
11	02099646.11	RAW2:B9673353	02/09/96 12:13:09	9602L916-~~006~~ 025	2		
12	02099646.12	RAW2:B9673374	02/09/96 12:32:47	9602L~~916-025~~	2	963-024	13 9602L963-028
13	02099646.13	RAW2:B9673380	02/09/96 12:52:24	9602L963-~~026~~ 28	2		16 96LLC017+MB1
14	02099646.14	RAW2:B9673391	02/09/96 13:12:02	IBLK			
15	02099646.15	RAW2:B9673399	02/09/96 13:31:43	STD 461118D		2/14/96	
16	02099646.16	RAW2:B9673415	02/09/96 13:51:22	~~9602L963-028~~	2		96LLC017-MB1
17	02099646.17	RAW2:B9673418	02/09/96 14:10:59	96LLC016-MB1			
18	02099646.18	RAW2:B9673421	02/09/96 14:30:35	96LLC016-MB1S			
19	02099646.19	RAW2:B9673433	02/09/96 14:50:12	9602L963-027			
20	02099646.20	RAW2:B9673439	02/09/96 15:09:50	9602L963-029			
21	02099646.21	RAW2:B9673448	02/09/96 15:29:29	9602L963-031			
22	02099646.22	RAW2:B9673460	02/09/96 15:49:07	9602L963-033	100		
23	02099646.23	RAW2:B9673464	02/09/96 16:08:43	9602L963-035	100		
24	02099646.24	RAW2:B9673467	02/09/96 16:28:19	9602L963-033D1			

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweber 2/17/96

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____________ MOBILE PHASE: Seelage 1 ____________ ANALYST: ____________

DETECTOR: ____________ ____________ FLOW RATE: ____________

WAVELENGTH: ____________ COLUMN TYPE: ____________ COLUMN SERIAL #: ____________

CALIBRATION STANDARD ____________ SPIKING STANDARD ____________

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02099646.25	RAW2:B9673477			02/09/96 16:47:56	9602L963-035D1		
26	02099646.26	RAW2:B9673489			02/09/96 17:07:34	IBLK		
27	02099646.27	RAW2:B9673495			02/09/96 17:27:15	STD 461118D		
28	02099646.28	RAW2:B9673499			02/09/96 17:46:51	96LLC017-MB1A1		
29	02099646.29	RAW2:B9673513			02/0[illegible]/96 18:06:27	96LLC017-MB1SA		
30	02099646.30	RAW2:B9673517			02/09/96 18:26:04	9602L916-006A1		
31	02099646.31	RAW2:B9673524			02/09/96 18:45:42	9602L916 025A1		
32	02099646.32	RAW2:B9673535			02/09/96 19:05:19	9602L963-026A1		
33	02099646.33	RAW2:B9673539			02/09/96 19:24:54	9602L963-028A1		
34	02099646.34	RAW2:B9673550			02/09/96 19:44:29	96LLC019-MB1		
35	02099646.35	RAW2:B9673560			02/09/96 20:04:06	96LLC019-MB1S		
36	02099646.36	RAW2:B9673569			02/09/96 20:23:44	9602L974-001	100	
37	02099646.37	RAW2:B9673577			02/09/96 20:43:21	9602L999-001	100	
38	02099646.38	RAW2:B9673581			02/09/96 21:02:57	IBLK		
39	02099646.39	RAW2:B9673591			02/09/96 21:22:38	STD 461118D		
40	02099646.40	RAW2:B9673604			02/09/96 21:42:15	9602L999-002	100	
41	02099646.41	RAW2:B9673612			02/09/96 22:01:53	9602L974-001D1		
42	02099646.42	RAW2:B9673622			02/09/96 22:21:31	9602L999-001A1		
43	02099646.43	RAW2:B9673633			02/09/96 22:41:09	9602L999-002D1	2/10/96	
44	02099646.44	RAW2:B9673641			02/09/96 23:00:43	9602L963-035D2	10	
45	02099646.45	RAW2:B9673645			02/09/96 23:20:20	96LLC018-MB1		
46	02099646.46	RAW2:B9673658			02/09/96 23:39:58	96LLC018-MB1S		
47	02099646.47	RAW2:B9673663			02/09/96 23:59:36	9602L952-001		
48	02099646.48	RAW2:BA673672			02/10/96 00:19:12	9602L952-002		

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: Sarlage l ______ ANALYST: ______

DETECTOR: ______ ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
49	02099646.49			RAW2:BA673682	02/10/96 00:38:47	9602L952-003		
50	02099646.50			RAW2:BA673691	02/10/96 00:58:24	INST. BLANK		
51	02099646.51			RAW2:BA673693	02/10/96 01:18:05	STD 461118D		
52	02099646.52			RAW2:BA673703	02/10/96 01:37:43	9602L952-004		
53	02099646.53			RAW2:BA673712	02/10/96 01:57:18	9602L952-005		
54	02099646.54			RAW2:BA673717	02/10/96 02:16:53	9602L952-007		
55	02099646.55			RAW2:BA673724	02/10/96 02:36:30	9602L952-008		
56	02099646.56			RAW2:BA673734	02/10/96 02:56:09	9602L952-009		2/10/96
57	02099646.57			RAW2:BA673743	02/10/96 03:15:46	9602L952-010		
58	02099646.58			RAW2:BA673749	02/10/96 03:35:22	9602L952-011		
59	02099646.59			RAW2:BA673753	02/10/96 03:54:56	9602L952-012		
60	02099646.60			RAW2:BA673765	02/10/96 04:14:33	9602L952-013		
61	02099646.61			RAW2:BA673770	02/10/96 04:34:11	9602L952-014		
62	02099646.62			RAW2:BA673774	02/10/96 04:53:49	INST. BLANK		
63	02099646.63			RAW2:BA673781	02/10/96 05:13:29	STD 461118D		
64	02099646.64			RAW2:BA673788	02/10/96 05:33:05	9602L952-015		
65	02099646.65			RAW2:BA673792	02/10/96 05:52:42	9602L952-015S		
66	02099646.66			RAW2:BA673797	02/10/96 06:12:23	9602L952-015T		
67	02099646.67			RAW2:BA673805	02/10/96 06:32:01	9602L952-016		
68	02099646.68			RAW2:BA673810	02/10/96 06:51:38	INST. BLANK		
69	02099646.69			RAW2:BA673815	02/10/96 07:11:18	STD 461118D		

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REVIEWED BY/DATE G. Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ____________ MOBILE PHASE: See Page 1 ANALYST: ____________

DETECTOR: ____________ FLOW RATE: ____________

WAVELENGTH: ____________ COLUMN TYPE: ____________ COLUMN SERIAL #: ____________

CALIBRATION STANDARD ____________ SPIKING STANDARD ____________

ANALYSIS	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	LOT ID #	COMMENTS
01	02109646.01	RAW2:BA673848	02/10/96 09:24:51	STD 461118D		
02	02109646.02	RAW2:BA673863	02/10/96 09:44:32	STD 461118D		
03	02109646.03	RAW2:BA673869	02/10/96 10:04:12	STD 461118D		
04	02109646.04	RAW2:BA673875	02/10/96 10:23:50	9602L952-005		
05	02109646.05	RAW2:BA673881	02/10/96 10:43:30	9602L916-026D1	2/12/96	
06	02109646.06	RAW2:BA673891	02/10/96 11:03:11	9602L952-008		
07	02109646.07	RAW2:BA673902	02/10/96 11:22:50	9602L952-015S		
08	02109646.08	RAW2:BA673908	02/10/96 11:42:30	~~INST. BLANK~~ STD 461118D		

End of Queue

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweber 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: HPLC#2
DETECTOR: HP 1050 UV
WAVELENGTH: 254 nm
CALIBRATION STANDARD 461130/41024011

MOBILE PHASE: 60% H_2O/40% ACN
30°C
COLUMN TYPE: Zorbax C8 4.6mm x 25cm
SPIKING STANDARD NA

ANALYST: G. Leinweber
FLOW RATE: 1.5ml/min
COLUMN SERIAL #: L17344

					COMMENTS
01	02069602.01	RAW2:B6672149	02/06/96 09:41:44	STD 461130F	
02	02069602.02	RAW2:B6672161	02/06/96 10:19:20	STD 461130E	
03	02069602.03	RAW2:B6672171	02/06/96 10:56:55	STD 461130D	
04	02069602.04	RAW2:B6672180	02/06/96 11:34:29	STD 461130C	08330
05	02069602.05	RAW2:B6672186	02/06/96 12:12:05	STD 461130B	02206
06	02069602.06	RAW2:B6672197	02/06/96 12:49:40	STD 461130A	
07	02069602.07	RAW2:B6672208	02/06/96 13:27:15	STD 41024011F	
08	02069602.08	RAW2:B6672221	02/06/96 14:28:04	STD 41024011E	
09	02069602.09	RAW2:B6672232	02/06/96 14:50:37	STD 41024011D	4-NT
10	02069602.10	RAW2:B6672236	02/06/96 15:13:12	STD 41024011C	02F06
11	02069602.11	RAW2:B6672243	02/06/96 15:35:47	STD 41024011B	
12	02069602.12	RAW2:B6672251	02/06/96 15:58:21	STD 41024011A	
13	02069602.13	RAW2:B6672258	02/06/96 16:20:55	OX	
14	02069602.14	RAW2:B6672264	02/06/96 16:43:29	9601L838-001	
15	02069602.15	RAW2:B6672274	02/06/96 17:06:02	9601L838-002	
16	02069602.16	RAW2:B6672281	02/06/96 17:28:37	9601L838-004	
17	02069602.17	RAW2:B6672292	02/06/96 17:51:12	9601L838-006	
18	02069602.18	RAW2:B6672301	02/06/96 18:13:43	9601L838-008	
19	02069602.20	RAW2:B6672318	02/06/96 18:58:48	INST. BLANK	
20	02069602.21	RAW2:B6672324	02/06/96 19:21:22	STD 461130D	
21	02069602.22	RAW2:B6672339	02/06/96 19:43:56	STD 41024011D	

G. Leinweber 2/9/96

G. Leinweber 2/9/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE [signature] 2/12/96

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #:

MOBILE PHASE: See Page 8

ANALYST:

DETECTOR:

FLOW RATE:

WAVELENGTH:

COLUMN TYPE:

COLUMN SERIAL #:

CALIBRATION STANDARD

SPIKING STANDARD

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	Dilution	)T ID #	COMMENTS
01	02099602.01	RAW2:B9673441	02/09/96 15:20:12	STD 461130D			
02	02099602.02	RAW2:B9673457	02/09/96 15:42:49	STD 461130D			
03	02099602.03	RAW2:B9673463	02/09/96 16:05:26	STD 461130D			
04	02099602.04	RAW2:B9673468	02/09/96 16:29:37	9602L916-018			Used Ø22A6 without
05	02099602.05	RAW2:B9673482	02/09/96 16:52:12	9602L916-018D1	10		level A.
06	02099602.06	RAW2:B9673490	02/09/96 17:14:48	9602L916-013	5000		and 02206 for
07	02099602.07	RAW2:B9673498	02/09/96 17:37:24	9602L916-024			TALEM G 2/12/96
08	02099602.08	RAW2:B9673510	02/09/96 17:59:57	9602L916-024D1	10		
09	02099602.09	RAW2:B9673516	02/09/96 18:22:31	9602L916-026			
10	02099602.10	RAW2:B9673525	02/09/96 18:45:06	9602L963-019	100		
11	02099602.11	RAW2:B9673536	02/09/96 19:07:41	9602L963-019D1	1000		
12	02099602.12	RAW2:B9673545	02/09/96 19:30:15	9602L963-024	50		
13	02099602.13	RAW2:B9673555	02/09/96 19:52:49	9602L963-024D1	5000		
14	02099602.14	RAW2:B9673566	02/09/96 20:15:22	IBLK			
15	02099602.15	RAW2:B9673572	02/09/96 20:37:56	STD 461130D			
16	02099602.16	RAW2:B9673580	02/09/96 21:00:31	9602L916-020			
17	02099602.17	RAW2:B9673594	02/09/96 21:23:05	9602L916-023	100		
18	02099602.18	RAW2:B9673607	02/09/96 21:45:37	9602L916-023D1	20000		
19	02099602.19	RAW2:B9673617	02/09/96 22:08:09	9602L963-030			
20	02099602.20	RAW2:B9673625	02/09/96 22:30:43	9602L963-032	50		
21	02099602.21	RAW2:B9673640	02/09/96 22:53:17	9602L963-034	50		
22	02099602.22	RAW2:B9673644	02/09/96 23:15:50	9602L916-013D1	100		
23	02099602.23	RAW2:B9673657	02/09/96 23:38:21	9602L974-001	100		
24	02099602.24	RAW2:B9673666	02/10/96 00:00:53	9602L999-001	100		

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweber 2/12/96

WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #:
DETECTOR:
WAVELENGTH:
CALIBRATION STANDARD

MOBILE PHASE: Sealage 8
COLUMN TYPE:
SPIKING STANDARD

ANALYST:
FLOW RATE:
COLUMN SERIAL #:

ANALYSIS DATE	ANALYSIS TIME	RUN NO.	INJ VOL	TRAY NO	RFW SAMPLE NUMBER	CLAS ID #	LOT ID #	COMMENTS
25	02099602.25			RAW2:BA673675	02/10/96 00:23:26	9602L999-002	100	
26	02099602.26			RAW2:BA673685	02/10/96 00:46:01	IBLK		
27	02099602.27			RAW2:BA673692	02/10/96 01:08:34	STD 461130D		
28	02099602.28			RAW2:BA673702	02/10/96 01:31:05	9602L963-033		
29	02099602.29			RAW2:BA673709	02/10/96 01:53:36	9602L963-033D1	100	
30	02099602.30			RAW2:BA673718	02/10/96 02:16:08	9602L963-035	10	
31	02099602.31			RAW2:BA673727	02/10/96 02:38:42	9602L963-035D1	100	
32	02099602.32			RAW2:BA673735	02/10/96 03:01:14	IBLK		
33	02099602.33			RAW2:BA673746	02/10/96 03:23:46	461130D		

2/10/96

End of Run 2/10/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leenwelle 2/12/96

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WESTON®

HPLC ANALYSIS LOG

INSTRUMENT #: ______ MOBILE PHASE: See Page 8 ANALYST: ______

DETECTOR: ______ FLOW RATE: ______

WAVELENGTH: ______ COLUMN TYPE: ______ COLUMN SERIAL #: ______

CALIBRATION STANDARD ______ SPIKING STANDARD ______

	SAMPLE ID	FILE ID	DATE/TIME	DESCRIPTION	⊃T ID #	COMMENTS
				Dilution		
01	02109602.01	RAW2:BA673850	02/10/96 09:26:27	STD 461130D		
02	02109602.02	RAW2:BA673868	02/10/96 09:49:04	STD 461130D		
03	02109602.03	RAW2:BA673872	02/10/96 10:11:41	STD 461130D		
04	02109602.04	RAW2:BA673878	02/10/96 10:34:19	9602L916-025 2		
05	02109602.05	RAW2:BA673889	02/10/96 10:56:54	9602L916-026D1 2		
06	02109602.06	RAW2:BA673898	02/10/96 11:19:29	9602L952-004		
07	02109602.07	RAW2:BA673909	02/10/96 11:42:05	9602L952-009		
08	02109602.08	RAW2:BA673915	02/10/96 12:04:38	9602L952-010		
09	02109602.09	RAW2:BA673924	02/10/96 12:27:11	9602L963-032D1 200		
10	02109602.10	RAW2:BA673929	02/10/96 12:49:46	9602L963-034D1 200		
11	02109602.11	RAW2:BA673936	02/10/96 13:12:22	IBLK		
12	02109602.12	RAW2:BA673947	02/10/96 13:34:57	STD 461130D		

2/12/96

RFW 21-21-022/B-01/92

REVIEWED BY/DATE G. Leinweh 2/12/96

PAGE # 11

WESTON

Standards Preparation Records

WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

Explosives Calibration Mix

MIXTURE I.D.#: 4611 18

DATE/ANALYST: 9/1/95

EXPIRATION DATE: Ongoing.

DATE REMOVED[1]:

Logbook #: 4611

	STOCK PARENT	% PURITY	STANDARD	FINAL VOLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)

EM SCIENCE
A Division of EM Industries, Inc.
P.O. Box 70
480 S. Democrat Road
Gibbstown, NJ 08027

Rec'd 9/1/95 4611 18

CERTIFICATE OF ANALYSIS

[redacted]

PRODUCT: EPS00872

DESCRIPTION: Custom Explosives Calibration Mix

LOT #: 085-338

SOLVENT: AcCN : MeOH (9:1)

EXPIRATION: On-going Stability Program

15 Components

Component	CAS #	Purity % (GC/FID)	Gravimetric Concentration[1] (µg/mL)	Analyte Concentration[2] (µg/mL)
2-Amino-4,6-dinitrotoluene	35572-78-2	100 (GC/MS)	6.30	6.30
4-Amino-2,6-dinitrotoluene	1946-51-0	100 (GC/MS)	6.25	6.25
1,3-Dinitrobenzene	99-65-0	98.2	6.25	6.14
2,4-Dinitrotoluene	121-14-2	98.0	6.35	6.22
2,6-Dinitrotoluene	606-20-2	98.3	6.50	6.45
HMX	2691-41-0	99.3 (HPLC)	55.1	54.7
Nitrobenzene	98-95-3	100 (GC/MS)	6.54	6.54
2-Nitrotoluene	88-72-2	98.0	25.0	24.8
3-Nitrotoluene	99-08-1	98.2	25.0	24.8
4-Nitrotoluene	99-99-0	98.0	75.5	74.7
RDX	121-82-4	98.6	25.0	24.7
Tetryl	479-45-8	98.8 (HPLC)	18.4	18.4
TNT	118-96-7	100 (HPLC)	6.33	6.33
1,3,5-Trinitrobenzene	99-35-4	98.4	6.34	6.24
1,2-Dinitrobenzene	528-29-0	100	10.1	10.1

1. All weights are traceable through National Bureau of Standards Test No. 731/243589 's'.
2. Analyte Conc. = Purity x Gravimetric Conc.

Quality Control Manager: Charles M. Wilson

Call: (800) 222-0342

9/1/95

Ampule ID	Date Opened	Disposal Date
A	9/1/95 GM	1/24/96 GM
B	1/24/96 GM	
C	~~1/23/96~~	
D		
E		
F		
G		
H		
I		
J		

[1]Date removed is the date the standards are given to the Waste Disposal Unit for disposition.

REVIEWED BY/DATE: 9/1/95

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RFW 21-21-036/D-03/94

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WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

MIXTURE I.D.#: 461129 Explosive Spike
DATE/ANALYST: 12/19/95 [signature]

EXPIRATION DATE: Ongoing - Tentative 1/1/97
DATE REMOVED[1]:

Logbook #: 4611

FINAL OLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)

EM SCIENCE
A Division of EM Industries, Inc.
P.O. Box 70
480 S. Democrat Road
Gibbstown, NJ 08027

Rec'd 12/14/95 [initials]
461129

CERTIFICATE OF ANALYSIS

[redacted]

PRODUCT: EPS00314
EXPIRATION: On-going Stability Program
DESCRIPTION: Custom Explosives Spiking Mix
LOT #: 095-190
SOLVENT: AcCN : MeOH (9:1)
14 Components

Component	CAS #	Purity % (GC/FID)	Gravimetric Concentration[1] (µg/mL)	Analyte Concentration[2] (µg/mL)
2-Amino-4,6-dinitrotoluene	35572-78-2	100 (GC/MS)	20.02	20.02
4-Amino-2,6-dinitrotoluene	1946-51-0	100 (GC/MS)	20.00	20.00
1,3-Dinitrobenzene	99-65-0	98.2	20.00	19.64
2,4-Dinitrotoluene	121-14-2	98.0	20.00	19.60
2,6-Dinitrotoluene	606-20-2	99.3	21.00	20.85
HMX	2691-41-0	99.3	17.64	17.52
Nitrobenzene	98-95-3	99.9 (GC/MS)	21.56	21.54
2-Nitrotoluene	88-72-2	99.0	80.5	79.7
3-Nitrotoluene	99-08-1	99.2	80.2	79.6
4-Nitrotoluene	99-99-0	99.0	240.9	238.5
RDX	121-82-4	98.6	80.3	79.2
Tetryl	479-45-8	99.8	52.00	51.90
TNT	118-96-7	100 (GC/MS)	20.12	20.12
1,3,5-Trinitrobenzene	99-35-4	98.4	20.14	19.82

1. All weights are traceable through National Bureau of Standards Test No. 731/243669's.
2. Analyte Conc. = Purity x Gravimetric Conc.

Quality Control Manager: [signature] Charles M. Wilson

For Technical Assistance Call: (800) 222-0342

Ampule ID	Date Opened	Disposal Date
A	12/2/95 [initials]	
B	1/30/96 [initials]	
C		
D		
E		
F		
G		
H		
I		
J		

Consumed 2/2/97

[signature] 12/19/95

[1]Date removed is the date the standards are given to the waste ... unit for disposition.

REVIEWED BY/DATE:

RFW 21-21-036/D-03/94

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WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

Logbook #: 4102

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
Kerosene	41023801	41021307	100 mg/mL	100uL	10mL	Hexane	1000ug/mL	5/25/95 GM	CS 6/3/95	CS 8/1/95
Triphenylene	41023802	" 41021507	1000ug/mL	1250uL	25mL	ACN	50ug/mL	5/26/95 GM	CS 6/3/95	GM 11/21/95
KEROSENE	41023803	AccuStandard 025-235			1mL	DCM	20 mg/mL	CS 6/14/95	GM 9/7/95	2/16/96
DIESEL FUEL	41023804	AccuStandard 055-314		—	5mL	DCM	50 mg/mL	CS 6/14/95	GM 9/7/95	
GASOLINE	41023805	AccuStd 123-180			1mL	Isooctane	100 mg/mL	CS 6/14/95	GM 9/7/95	2/16/96
DIESEL FUEL	41023806	AccuStd 084-259			1mL	Isooctane	100 mg/mL	CS 6/14/95	GM 9/7/95	01/16/96
JET TURBINE FUEL	41023807	AccuStd 123-192			1mL	Isooctane	100 mg/mL	CS 6/14/95	GM 9/7/95	1/16/96
HMX	41023808	EM Science 114-237			1mL	MeOH/ACN 1:1	993 ug/mL	CS 6/14/95	GM 9/7/95	1/16/96
RDX	41023809	EM Science 015-032			1mL		986 ug/mL	CS 6/14/95	GM 9/7/95	
1,3,5-TNB	41023810	EM Science 114-221			1mL		984 ug/mL	CS 6/14/95	GM 9/7/95	
1,3-DNB	41023811	EM Science 035-207			1mL		982 ug/mL	CS 6/14/95	GM 9/7/95	

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

Logbook #: 4102

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
Nitrobenzene	41023901	EM Science 114-219	~~1000~~		1	MeOH/ACN 1:1	1000	CJ 6/14/95	Gm 9/7/95	
Tetryl	41023902	EM Science 025-101			1		1000	CJ 6/14/95	Gm 9/7/95	
2-Amino-4,6-DNT	41023903	EM Science 104-266			1		1002	CJ 6/14/95	Gm 9/7/95	
4-Amino-2,6-DNT	41023904	EM Science 114-239			1		1000	CJ 6/14/95	Gm 9/7/95	
TNT	41023905	EM Science 114-220			1		1001	CJ 6/14/95	Gm 9/7/95	
2,6-DNT	41023906	EM Science 124-511			1		1000	CJ 6/14/95	Gm 9/7/95	
2,4-DNT	41023907	EM Science 015-266			1		988	CJ 6/14/95	Gm 9/7/95	
2-Nitrotoluene	41023908	EM Science 104-334			1		990	CJ 6/14/95	Gm 9/7/95	
4-Nitrotoluene	41023909	EM Science 015-152			1		990	CJ 6/14/95	Gm 9/7/95	
3-Nitrotoluene	41023910	EM Science 114-238			1		993	CJ 6/14/95	Gm 9/7/95	
~~Ethylene Glycol~~	~~41023911~~	~~41020404~~	~~Neat~~						Gm 2/7/95	

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

WESTON®

HPLC STANDARDS PREPARATION LOG
Preparation of Stock Mixture Solution (Multi-Component)

MIXTURE I.D.#: 461130 Explosive Conf. mix EXPIRATION DATE: 6/1/96
DATE/ANALYST: 1/3/96 G. Leinweber DATE REMOVED[1]:

Logbook #: 4611

COMPONENT	DESCRIPTION	STOCK PARENT or NEAT ID	~~% PURITY~~ (neat only) Conc.	STANDARD WEIGHT/VOLUME (w/units)	FINAL VOLUME (mL)	SOLVENT	COMPONENT CONC. (w/units)
HMX		41023808	993 ug/mL	276.9 uL	5 mL	ACN	55 ug/mL
RDX		41023809	986	136.9			27
1,3,5-TNB		41023810	984	32.0			6.3
1,3-DNB		41023811	982	32.1			6.3
Nitrobenzene		41023901	1000	32.5			6.5
Tetryl		41023902	1000	94.0			18.8
2-Amino-4,6-DNT		41023903	1002	31.4			6.3
TNT		41023905	1001	31.5			6.3
2,6-DNT		41023906	1000	32.5			6.5
2,4-DNT		41023907	988	31.9			6.3

[1]Date removed is the date the standards are given to the Waste Disposal Unit for disposition.

REVIEWED BY/DATE: [signature] 1/24/96

RFW 21-21-036/D-03/94

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WESTON®

Logbook #: 402

HPLC STANDARDS LOGBOOK
NEAT STANDARDS DOCUMENTATION

COMPOUND	WESTON STANDARD ID	VENDOR	VENDOR LOT ID	PURITY %	EXPIRATION DATE	DATE RECEIVED	DATE REMOVED[1]	
Nitroglycerin	41020701	EM Science EPM80280	104.275		9/1/98	8/31/95 CS		1000 ug/mL
Ethylene Oxide	41020702	EM Science EPS00745	105-168		Ongoing	10/17/95 CS		1005 ug/mL
7H-Dibenzo(c,g)carbazole	41020703	EM Science EPH00134	920-331	99.7	Ongoing	10/31/95 CS		
Dibenzo(a,h) pyrene	41020704	EM Science EPH00136	06110	-	Ongoing	10/31/95 CS		50 ug/mL
Dibenzo(a,i) pyrene	41020705	Radian ERD-001	HKY-26044-57	99%		CS 10/31/95		
3-Methylcholanthrene	41020706	EM Science EPH00112	111-098	98.7	Ongoing	CS 10/31/95		
Benzo(j)fluoranthene	41020707	Radian ERB-005	CAP-24573-50	98		CS 10/31/95		
Dibenz(a,h)acridine	41020708	Radian ERD-013	HKY-27456-44	99		CS 10/31/95		
Dibenz(a,j)acridine	41020709	Radian ERD-014	HKY-27456-47	99		CS 10/31/95		
1,2-Dinitrobenzene	41020710	AccuStandard M-8330-55	095-233	98.6	Ongoing	CS 11/6/95		1003 ug/mL

RFW 21-21-036/F-03/94

REVIEWED BY/DATE: [signature] 11/6/95

[1]Date Removed is the date the standards are given to the Waste Disposal Unit for disposition.

Page #: 007

WESTON®

HPLC STANDARDS PREPARATION LOGBOOK
Preparation of Standard Dilutions (Single Component)

Logbook #: 4102

COMPOUND	STANDARD DILUTION I.D.	PARENT STANDARD I.D.	PARENT CONC. (w/units)	PARENT VOLUME (mL)	TOTAL VOLUME (mL)	SOLVENT	PREPARED STANDARD CONC. (w/units)	DATE/ ANALYST	REVIEWED BY/DATE	DATE REMOVED[1]
RDX	41024001	41020304	1002ug/mL	27uL	1mL	ACN	27.05ug/mL	8/24/95 GM		1/16/96
RDX	41024002	41024001	27.05ug/mL ~~100ug~~ GM 8/24/95	100uL	1mL	ACN	2.705ug/mL	8/24/95 GM		1/16/96
Picric Acid	41024003	41021708	1010 ug/mL	1mL	10mL	ACN	101 ug/mL	8/29/95	GM 9/5/95	
Picric Acid	41024004	41020609	1000	1mL	10mL	ACN	100 ug/mL	8/29/95	GM 9/5/95	
~~2H-dibenzo(c,g)carbazole~~	~~41024005~~	~~41020703~~	10/31/95							
Triphenylene	41024006	41021907 ~~41020810~~ GM 11/9/95	1000ug/mL	1250mL	25mL	ACN	50ug/mL	GM 11/95	12/21/95	
Triphenylene (to use 1mL) Surr	41024007	41021908	500ug/mL	1mL	100mL	ACN	5 ug/mL	GDL 11/14/95		
~~Motor Oil 10W-30~~	~~41024008~~	~~41020103~~						GM 12/5/95		
1,2-DNB Surr	41024009	41020710	1003 ug/mL	0.810	10mL	ACN	81.243 ug/mL	GM 12/20/95	12/21/95	
p-Terphenyl	41024010	39850303	NEAT ~~0.0125g~~	0.0125g	250mL	Acetone (w/DCM/MeOH)	50 ug/mL	1/2/96	GM 1/4/96	
4-Nitrotoluene	41024011	41023909	1.0mg/mL	74.7uL	1mL	ACN	74.7ug/mL	GM 2/2/96		

[1]Date removed is the date standards are given to the Waste Disposal Unit for disposition.

RFW 21-21-036/C-03/94

PAGE # [illegible]

WESTON

Preparation Logs

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96116C15 SDG File Y/N: N/A

Analyst: F[illegible] Test: 8330 Method: 2SCE Solvent: ACN AAPrep: |

	RFW #	Vol (mL)	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank	(770)	W		1 (770)	1		10	2	N
2	Blank Spike	(770)	|		|	|	1	|	|	|
3	96C2L963 - 004	(550)	|		|	|		|	|	|
4	| -009	(530)	|		|	|		|	|	|
5	| -014**	(200)	|		|	|		|	|	|
6	| -019*	(310)	|		|	|		|	|	|
7	| -024*	(310)	|		|	|		|	|	|
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

F[illegible] 2/8/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: N/A

End time: |

BN Fraction (Date/Time/Initials)

Start time: N/A

End time: |

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown: |

Blowdown: |

GPC Ready: |

GPC Cleanup: |

GPC #: |

After GPC Boildown: |

After GPC Blowdown: |

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: F[illegible] 2/8/96

GPC Lab ID #: N/A

Florisil Lot #: |

Florisil Lab ID #: |

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to Volume (770 mL) w/ DI H_2O

* Bright Yellow Extracts [illegible] [illegible] test Compounds

** Sample 014 [illegible] [illegible] [illegible] after 15 min [illegible] [illegible] (~50 mL) [illegible]

[illegible] added 2 mL ACN on 2nd [illegible]. 22 mL [illegible] for [illegible] [illegible]

Surrogate: 50 uL 414[illegible] Spike: 125 uL 461129B Witness:

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: F[illegible] 2/8/96

Roy F. Weston, Inc. Lionville, Lab. 235

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96 Extraction Batch No: 96LLC015 Analyst: FK Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/15/96 Solvent: ACN Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L963-	COE-HOT GAS										
004 0	AFTOUT-EXPLSV-R2COMP	7	1	1.0		10.0		2.0	N	0.0	20
009 0	AFTOUT-EXPLSV-R3COND	7	1	1.0		10.0		2.0	N	0.0	20
014 0	AFTOUT-EXPLSV-BTCOND	7	1	1.0		10.0		2.0	N	0.0	20
019 0	AFTIN-EXP-R2-COND	7	1	1.0		10.0		2.0	N	0.0	20
024 0	AFTIN-EXP-R3-COND	7	1	1.0		10.0		2.0	N	0.0	20
96LLC015-MB1 0	BLK	7	1	1.0		10.0		2.0	N	0.0	20
96LLC015-MB1 0S	BLK	7	1	1.0	1.0	10.0		2.0	N	0.0	20

Comments:
Surrogate: 50 uL 41024009
Spike: 125 uL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LC016 SDG File Y/N: ______

Analyst: Schnell Test: 8330 Method: SONC Solvent: ACN AAPrep: ______

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L963-027	Air			10		100	2	N
2	029								
3	031								
4	033								
5	035								
6	Blank								
7	BS					10			
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

[illegible] 2/8/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ______

End time: ______

BN Fraction (Date/Time/Initials)

Start time: ______

End time: ______

Extraction Information (Date/Analyst)

Filtration: ______

Boildown: ______

Blowdown: ______

GPC Ready: ______

GPC Cleanup: ______

GPC #: ______

After GPC Boildown: ______

After GPC Blowdown: ______

Acid/Florisil/Alumina Cleanup: ______

Prep Sheet: [illegible] 2/8/96

GPC Lab ID #: ______

Florisil Lot #: ______

Florisil Lab ID #: ______

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: XAD + Filter Composites

ON 1430 2/8/96

OFF 0830 2/9/96

Surrogate: 40 µL 4I0247I0 1.20 NB@100 %L Spike: 1.25 mL 4611298 [illegible] Witness: ______

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: [illegible] 2/8/96

RFW 21-21-019/Z-11/93

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96 Extraction Batch No: 96LLC016 Analyst: CS Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/08/96 Solvent: ACN Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solid	C/D FACTOR
9602L963-	COE-HOT GAS										
027 0	AFTOUT-EXPLSV-R2-FX	7		10.0		100		2	N		200.0
029 0	AFTOUT-EXPLSV-R3-FX	7		10.0		100		2	N		200.0
031 0	AFTOUT-EXPLSV-BT-FX	7		10.0		100		2	N		200.0
033 0	AFTIN-EXP-R2-FX	7		10.0		100		2	N		200.0
035 0	AFTIN-EXP-R3-FX	7		10.0		100		2	N		200.0
96LLC016-MB1 0		7		10.0		100		2	N		200.0
96LLC016-MB1 0S		7		10.0	10.0	100		2	N		200.0

Comments: XAD + FILTER COMPOSITES; 100 mL ACN; 18 Hour Sonc
Surrogate: 40 uL 41020710 1,2-DNB @ 1000 ug/mL\
Spike: 1.25 mL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

[illegible]

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LLC017 SDG File Y/N: -

Analyst: G. Leinweber Test: 08330 Method: KD Solvent: ACN AAPrep: 2/8/96

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-006	Sdo		370	1		10	2	N
2	-020			210					
3	-023			240					
4	-025			220					
5	96021963-026			240					
6	-028			210					
7	-030			180					
8	-032			235					
9	-034			325					
10	Blank			200					
11	Blank spike			200		1			
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

G. Leinweber 2/9/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration:

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: 2/9/96 GL

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: DCM/ACETONE SD.SD used for B + BS
All initial volumes to be logged in as 1 for total ug.
Water in all samples requiring Sodium Sulfate filtering

Surrogate: 50ul 410240 1,2DNB Spike: 461129B 125 uL Witness:

This Page Reviewed By/Date: [illegible] 2/12/96 Reviewed Against LIMS By/DATE: [illegible] 2/12/96

RFW 21-21-019/Z-11/93

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96   Extraction Batch No: 96LLC017   Analyst: GL   Method: ****

Test: 0833   Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/09/96   Solvent: DCM/ACETONE TO ACN   Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
006 0	IN/OUT-EXP/SV-SB-ACE	7	1	1.0		10		2.0	N	0.0	20.0
020 0	AFTOUT-EXP/SV-R1-FB	7	1	1.0		10		2.0	N	0.0	20.0
023 0	AFTIN-EXP-R1-FB	7	1	1.0		10		2.0	N		20.0
025 0	AFTIN-EXP-R1MS-FB	7	1	1.0		10		2.0	N		20.0
9602L963-	COE-HOT GAS										
026 0	AFTOUT-EXPLSV-R2-FB	7	1	1.0		10		2.0	N		20.0
028 0	AFTOUT-EXPLSV-R3-FB	7	1	1.0		10		2.0	N		20.0
030 0	AFTOUT-EXPLSV-BT-FB	7	1	1.0		10		2.0	N		20.0
032 0	AFTIN-EXP-R2-FB	7	1	1.0		10		2.0	N	0.0	20.0
034 0	AFTIN-EXP-R3-FB	7	1	1.0		10		2.0	N	0.0	20.0
96LLC017-MB1 0	BLK	7	1	1.0		10		2.0	N		20.0
96LLC017-MB1 0S	BLK	7	1	1.0	1.0	10		2.0	N		20.0

Comments: ALL REQUIRED FILTRATION THROGH SODIUM SULFATE
Surrogate: 50UL 41024101 1,2-DNB
Spike: 125UL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
NA					

GL 2/9/96

Other/Miscellaneous

End of Data Package

SEMIVOLATILE ORGANICS

Roy F. Weston, Inc. - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/02/96 RFW LOT # :9602L916

CLIENT ID	RFW #		MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-EXP/SV-R1-CND	004		AI	96LE0209	01/31/96	02/09/96	02/11/96
AFTOUT-EXP/SV-R1-CND	004	A1	AI	96LE0209	01/31/96	02/09/96	02/15/96
IN/OUT-EXP/SV-SB-ACE	006		AI	96LE0209	01/31/96	02/09/96	02/12/96
IN/OUT-EXP/SV-SB-CND	009		AI	96LE0209	01/31/96	02/09/96	02/11/96
AFTIN-EXP-R1-CND	013		AI	96LE0236	01/31/96	02/14/96	02/17/96
AFTIN-EXP-R1MS-CND	018		AI	96LE0236	02/01/96	02/14/96	02/17/96
AFTOUT-EXP/SV-R1-FB	020		AI	96LE0209	01/31/96	02/09/96	02/11/96
AFTOUT-EXP/SV-R1-FX	021		AI	96LE0209	01/31/96	02/09/96	02/11/96
AFTOUT-EXP/SV-R1-FX	021	A1	AI	96LE0209	01/31/96	02/09/96	02/15/96
IN/OUT-EXP/SV-SB-FX	022		AI	96LE0209	01/31/96	02/09/96	02/11/96
AFTIN-EXP-R1-FB	023		AI	96LE0236	01/31/96	02/14/96	02/17/96
AFTIN-EXP-R1-FX	024		AI	96LE0236	01/31/96	02/14/96	02/17/96
AFTIN-EXP-R1MS-FB	025		AI	96LE0236	02/01/96	02/14/96	02/17/96
AFTIN-EXP-R1MS-FX	026		AI	96LE0236	02/01/96	02/14/96	02/17/96

LAB QC:

SBLKSO	MB1		AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSO	MB1	BS	AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSO	MB1	BSD	AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSX	MB1		AI	96LE0236	N/A	02/14/96	02/17/96
SBLKSX	MB1	BS	AI	96LE0236	N/A	02/14/96	02/17/96
SBLKSX	MB1	BSD	AI	96LE0236	N/A	02/14/96	02/17/96

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mmz/11-95/toc.88

rm 2/22/96

CC2

CHAIN OF CUSTODY

RFW
Explosives - AFT OUTLET

WESTON Analytics Use Only: 9602L916

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 3

Client: COE - HOT GAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill X7201
AD Project Manager: K. Baker
QC: SDD   TAT: 14 day
Date Rec'd: 2/2/96   Date Due: 2/16/96
Account #: COEHOTGAS

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; 8330 Explosives; INORG: Metal, CN

all samples

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS / MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330	*	:RO	Semi-Volatiles EPA 8270	
001	COE-HG-AFTOUT-EXP/SV-R1-FH		Air	1/31/96		X			X	Run One
002	COE-HG-AFTOUT-EXP/SV-R1-FILT					X			X	
003	COE-HG-AFTOUT-EXP/SV-R1-XAD					X			X	
004	COE-HG-AFTOUT-EXP/SV-R1-COND		H2O			X	✓	✓	X	
005	COE-HG-AFTOUT-EXP/SV-R1-BH		Air			X			X	
006	COE-HG-IN/OUT-EXP/SV-SB-AE		Air	1/31/96		X	✓		X	Site Blanks
007	COE-HG-IN/OUT-EXP/SV-SB-FIL		Air			X			X	
008	COE-HG-IN/OUT-EXP/SV-SB-XAD					X			X	
009	COE-HG-IN/OUT-EXP/SV-SB-H2O		H2O			X	✓		X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
*RDX; HMX; Tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT

1:6 Filter #'s given

DATE/REVISIONS:
1. Analyze 1 run of
2. the Exp/SV for
3. lower carbon number
4. semivolatiles using
5. EPA 8015. Select run
6. with highest explosives

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
		2/2/96	1 PM				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only
Samples were: 1) Shipped X or Hand Delivered; Airbill # see page 2; 2) Ambient or Chilled; 3) Received in Good Condition Y or N; 4) Labels Indicate Properly Preserved Y or N; 5) Received Within Holding Times Y or N
COC Tape was: 1) Present on Outer Package Y or N; 2) Unbroken on Outer Package Y or N; 3) Present on Sample Y or N; 4) Unbroken on Sample Y or N; COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91   L372   L373   L375   L377   L378   Ref#   Cooler#   381 596a

See page #3 for revisions
COE HG truncated from ID to accommodate form

RFW
Explosives - AFT. INLET

WESTON Analytics Use Only: 96C129!6

Custody Transfer Record/Lab Work Request

WESTON

Client: COE HOTGAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill x7201
AD Project Manager: K. Baker
QC: SDO Dpp: STD CTAT 14 day
Date Rec'd: 2/2/96 Date Due: 2/16/96
Account #: COE HOTGAS

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb, 8330
INORG: Metal, CN

WESTON Analytics Use Only: EXPLOSIVES EPA 8330*; Semi vol. 8015**

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330*			Semi vol. 8015**		
010	COE-HG-AFTIN-EXP-RI-FHS			Air	1/31/96		X			X NO		
011	COE-HG-AFTIN-EXP-RI-FILT						X			X NO		
012	COE-HG-AFTIN-EXP-RI-XAD						X				Run One	
013	COE-HG-AFTIN-EXP-RI-COND			Air			X	✓	✓	✓		
014	COE-HG-AFTIN-EXP-RI-BHS			Air			X					
015	COE-HG-AFTIN-EXP-RIMS-AU				1/31/96-2/1/96		X					
016	COE-HG-AFTIN-EXP-RIMS-FILT					500	X				Run One	
017	COE-HG-AFTIN-EXP-RIMS-XAD						X				MID	
018	COE-HG-AFTIN-EXP-RIMS-COND			Air			X	✓	✓		SOAK	
019	COE-HG-AFTIN-EXP-RIMS-BHS			Air			X					

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
* RDX; HMX; Tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT
** Analyze 1 of 3 1st runs for semivolatiles only EPA 8015 - select run based on highest 8330 value.

DATE/REVISIONS:
1. Note R1 INLET SAMPLES
2. MAY Be have elevated
3. concentration - XAD and
4. Condensate - yellow
5. lower carbon number

Relinquished by	Received by	Date	Time
[signature]	[signature]	2/2/96	1:00

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

WESTON Analytics Use Only
Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 9985723477
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N

8.5°, 8.5°, 11.6°, 7.4°, 1.2°

WESTON Analytics Use Only

9602L916

Custody Transfer Record/Lab Work Request

WESTON

Client COEHOT GAS
Est. Final Proj. Sampling Date
Work Order #
Project Contact/Phone #
AD Project Manager
QC Del TAT
Date Rec'd Date Due
Account #

Refrigerator #															
#/Type Container	Liquid														
	Solid														
Volume	Liquid														
	Solid														
Preservatives															
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb					INORG: Metal	CN				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

WESTON Analytics Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	0625H	DRO	Herb	08330				
020	AFTOUT-EXP/SV-R1-FB			Air	1/31/96			✓	✓		✓				Compos. 001 + 005
21	AFTOUT-EXP/SV-R1-FX							✓	✓		✓				002 + 003
22	IN/OUT-EXP/SV-SBFX							✓			✓				007 + 008
23	AFTIN-EXP-R1-FB							✓	✓		✓				010 + 014
24	AFTIN-EXP-R1-FX							✓	✓		✓				011 + 012
25	AFTIN-EXP-RIMS-FB				2/1/96			✓			✓				015 + 019
26	AFTIN-EXP-RIMS-FX				2/1/96			✓			✓				016 + 017

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
FB = FHS + BHS Composite
FX = FILT + XAD Composite

2/20/96 Corrected Date Collection on #025, 026 per SP# 96PM0020

DATE/REVISIONS:
2/12/96 1. 625H added to 013, 018, 023, 024, 025
2. 026 per 96PM0090
2/14/96 3. All matrix's on all samples
4. are Air per SP# 96PM0098
5. DRO Added to 004, 013, 020, 021, 023
6. + 024 per 96PM0097

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	[signature]	2/7/96	1:00				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

DATA SUMMARY

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List   Report Date: 02/21/96 16:11

RFW Batch Number: 9602L916   Client: COE-HOT GAS   Work Order: 02281012012   Page: 1a

	Cust ID:	AFTOUT-EXP/S V-R1-CND	AFTOUT-EXP/S V-R1-CND	IN/OUT-EXP/S V-SB-ACE	IN/OUT-EXP/S V-SB-CND	AFTIN-EXP-R1 -CND	AFTIN-EXP-R1 MS-CND
Sample	RFW#:	004	004 RE	006	009	013	018
Information	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	2.50	2.50	2.50	2.50	62.5	2.50
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
	Nitrobenzene-d5	68 %	48 %	79 %	55 %	38 %	62 %
Surrogate	2-Fluorobiphenyl	66 %	54 %	74 %	58 %	69 %	75 %
Recovery	p-Terphenyl-d14	110 %	93 %	96 %	88 %	77 %	82 %
	Phenol-d5	57 %	41 %	70 %	46 %	41 %	64 %
	2-Fluorophenol	78 %	43 %	98 %	63 %	86 %	109 %
	2,4,6-Tribromophenol	86 %	59 %	79 %	75 %	60 %	68 %
		fl	fl	fl	fl	fl	fl
Phenol		25 U	25 U	25 U	25 U	620 U	25 U
bis(2-Chloroethyl)ether		25 U	25 U	25 U	25 U	620 U	25 U
2-Chlorophenol		25 U	25 U	25 U	25 U	620 U	25 U
1,3-Dichlorobenzene		25 U	25 U	25 U	25 U	620 U	25 U
1,4-Dichlorobenzene		25 U	25 U	25 U	25 U	620 U	25 U
Benzyl alcohol		25 U	25 U	25 U	25 U	620 U	25 U
1,2-Dichlorobenzene		25 U	25 U	25 U	25 U	620 U	25 U
2-Methylphenol		25 U	25 U	25 U	25 U	620 U	25 U
bis(2-Chloroisopropyl)ether		25 U	25 U	25 U	25 U	620 U	25 U
4-Methylphenol		25 U	25 U	25 U	25 U	620 U	25 U
N-Nitroso-Di-n-propylamine		25 U	25 U	25 U	25 U	620 U	25 U
Hexachloroethane		25 U	25 U	25 U	25 U	620 U	25 U
Nitrobenzene		25 U	25 U	25 U	25 U	620 U	25 U
Isophorone		25 U	25 U	25 U	25 U	620 U	25 U
2-Nitrophenol		25 U	25 U	25 U	25 U	620 U	25 U
2,4-Dimethylphenol		25 U	25 U	25 U	25 U	620 U	25 U
Benzoic acid		120 U	120 U	120 U	120 U	3100 U	120 U
bis(2-Chloroethoxy)methane		25 U	25 U	25 U	25 U	620 U	25 U
2,4-Dichlorophenol		25 U	25 U	25 U	25 U	620 U	25 U
1,2,4-Trichlorobenzene		25 U	25 U	25 U	25 U	620 U	25 U
Naphthalene		25 U	25 U	25 U	25 U	620 U	25 U
4-Chloroaniline		25 U	25 U	25 U	25 U	620 U	25 U
Hexachlorobutadiene		25 U	25 U	25 U	25 U	620 U	25 U
4-Chloro-3-methylphenol		25 U	25 U	25 U	25 U	620 U	25 U
2-Methylnaphthalene		25 U	25 U	25 U	25 U	620 U	25 U
Hexachlorocyclopentadiene		25 U	25 U	25 U	25 U	620 U	25 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L916 Client: COE-HOT GAS Work Order: 02281012012 Page: 1b

600

Cust ID:	AFTOUT-EXP/S V-R1-CND		AFTOUT-EXP/S V-R1-CND		IN/OUT-EXP/S V-SB-ACE		IN/OUT-EXP/S V-SB-CND		AFTIN-EXP-R1 -CND		AFTIN-EXP-R1 MS-CND	
RFW#:	004		004 RE		006		009		013		018	
2,4,6-Trichlorophenol	25	U	25	U	25	U	25	U	620	U	25	U
2,4,5-Trichlorophenol	120	U	120	U	120	U	120	U	3100	U	120	U
2-Chloronaphthalene	25	U	25	U	25	U	25	U	620	U	25	U
2-Nitroaniline	120	U	120	U	120	U	120	U	3100	U	120	U
Dimethylphthalate	25	U	25	U	25	U	25	U	620	U	25	U
Acenaphthylene	25	U	25	U	25	U	25	U	620	U	25	U
2,6-Dinitrotoluene	25	U	25	U	25	U	25	U	620	U	25	U
3-Nitroaniline	120	U	120	U	120	U	120	U	3100	U	120	U
Acenaphthene	25	U	25	U	25	U	25	U	620	U	25	U
2,4-Dinitrophenol	120	U	120	U	120	U	120	U	3100	U	120	U
4-Nitrophenol	120	U	120	U	120	U	120	U	3100	U	120	U
Dibenzofuran	25	U	25	U	25	U	25	U	620	U	25	U
2,4-Dinitrotoluene	25	U	25	U	25	U	25	U	620	U	25	U
Diethylphthalate	8	J	8	J	25	U	25	U	620	U	25	U
4-Chlorophenyl-phenylether	25	U	25	U	25	U	25	U	620	U	25	U
Fluorene	25	U	25	U	25	U	25	U	620	U	25	U
4-Nitroaniline	120	U	120	U	120	U	120	U	3100	U	120	U
4,6-Dinitro-2-methylphenol	120	U	120	U	120	U	120	U	3100	U	120	U
N-Nitrosodiphenylamine (1)	25	U	25	U	25	U	25	U	620	U	25	U
4-Bromophenyl-phenylether	25	U	25	U	25	U	25	U	620	U	25	U
Hexachlorobenzene	25	U	25	U	25	U	25	U	620	U	25	U
Pentachlorophenol	3	JB	120	U	120	U	120	U	3100	U	120	U
Phenanthrene	25	U	25	U	25	U	25	U	620	U	25	U
Anthracene	25	U	25	U	25	U	25	U	620	U	25	U
Di-n-Butylphthalate	5	J	25	U	25	U	25	U	620	U	25	U
Fluoranthene	25	U	25	U	25	U	25	U	620	U	25	U
Pyrene	25	U	25	U	25	U	25	U	620	U	25	U
Butylbenzylphthalate	25	U	25	U	25	U	25	U	620	U	25	U
3,3'-Dichlorobenzidine	50	U	50	U	50	U	50	U	1200	U	50	U
Benzo(a)anthracene	25	U	25	U	25	U	25	U	620	U	25	U
Chrysene	25	U	25	U	25	U	25	U	620	U	25	U
bis(2-Ethylhexyl)phthalate	14	JB	8	JB	25	U	25	U	620	U	4	J
Di-n-Octyl phthalate	25	U	25	U	25	U	25	U	620	U	25	U
Benzo(b)fluoranthene	25	U	25	U	25	U	25	U	620	U	25	U
Benzo(k)fluoranthene	25	U	25	U	25	U	25	U	620	U	25	U
Benzo(a)pyrene	25	U	25	U	25	U	25	U	620	U	25	U
Indeno(1,2,3-cd)pyrene	25	U	25	U	25	U	25	U	620	U	25	U
Dibenzo(a,h)anthracene	25	U	25	U	25	U	25	U	620	U	25	U
Benzo(g,h,i)perylene	25	U	25	U	25	U	25	U	620	U	25	U
Carbazole	25	U	25	U	25	U	25	U	620	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

010

Roy F. Weston, Inc. - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

Report Date: 02/21/96 16:11

RFW Batch Number: **9602L916** Client: **COE-HOT GAS** Work Order: 02281012012 Page: 2a

	Cust ID:	**AFTOUT-EXP/S V-R1-FB**	**AFTOUT-EXP/S V-R1-FX**	**AFTOUT-EXP/S V-R1-FX**	**IN/OUT-EXP/S V-SB-FX**	**AFTIN-EXP-R1 -FB**	**AFTIN-EXP-R1 -FX**
Sample Information	RFW#:	**020**	**021**	**021 RE**	**022**	**023**	**024**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	2.50	25.0	25.0	25.0	62.5	25.0
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
Surrogate Recovery	Nitrobenzene-d5	47 %	68 %	43 %	71 %	40 %	56 %
	2-Fluorobiphenyl	52 %	61 %	42 %	72 %	82 %	71 %
	p-Terphenyl-d14	83 %	85 %	87 %	84 %	76 %	79 %
	Phenol-d5	40 %	55 %	33 %	48 %	55 %	60 %
	2-Fluorophenol	53 %	74 %	33 %	69 %	104 %	99 %
	2,4,6-Tribromophenol	75 %	83 %	56 %	61 %	62 %	67 %
		fl	fl	fl	fl	fl	fl
Phenol		25 U	250 U	250 U	250 U	620 U	250 U
bis(2-Chloroethyl)ether		25 U	250 U	250 U	250 U	620 U	250 U
2-Chlorophenol		25 U	250 U	250 U	250 U	620 U	250 U
1,3-Dichlorobenzene		25 U	250 U	250 U	250 U	620 U	250 U
1,4-Dichlorobenzene		25 U	250 U	250 U	250 U	620 U	250 U
Benzyl alcohol		25 U	250 U	250 U	250 U	620 U	250 U
1,2-Dichlorobenzene		25 U	250 U	250 U	250 U	620 U	250 U
2-Methylphenol		25 U	250 U	250 U	250 U	620 U	250 U
bis(2-Chloroisopropyl)ether		25 U	250 U	250 U	250 U	620 U	250 U
4-Methylphenol		25 U	250 U	250 U	250 U	620 U	250 U
N-Nitroso-Di-n-propylamine		25 U	250 U	250 U	250 U	620 U	250 U
Hexachloroethane		25 U	250 U	250 U	250 U	620 U	250 U
Nitrobenzene		25 U	250 U	250 U	250 U	620 U	250 U
Isophorone		25 U	250 U	250 U	250 U	620 U	250 U
2-Nitrophenol		25 U	250 U	250 U	250 U	620 U	250 U
2,4-Dimethylphenol		25 U	250 U	250 U	250 U	620 U	250 U
Benzoic acid		120 U	1200 U	1200 U	1200 U	3100 U	1200 U
bis(2-Chloroethoxy)methane		25 U	250 U	250 U	250 U	620 U	250 U
2,4-Dichlorophenol		25 U	250 U	250 U	250 U	620 U	250 U
1,2,4-Trichlorobenzene		25 U	250 U	250 U	250 U	620 U	250 U
Naphthalene		25 U	250 U	250 U	250 U	620 U	250 U
4-Chloroaniline		25 U	250 U	250 U	250 U	620 U	250 U
Hexachlorobutadiene		25 U	250 U	250 U	250 U	620 U	250 U
4-Chloro-3-methylphenol		25 U	250 U	250 U	250 U	620 U	250 U
2-Methylnaphthalene		25 U	250 U	250 U	250 U	620 U	250 U
Hexachlorocyclopentadiene		25 U	250 U	250 U	250 U	620 U	250 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L916   Client: COE-HOT GAS   Work Order: 02281012012   Page: 2b

Cust ID:	AFTOUT-EXP/S V-R1-FB		AFTOUT-EXP/S V-R1-FX		AFTOUT-EXP/S V-R1-FX		IN/OUT-EXP/S V-SB-FX		AFTIN-EXP-R1 -FB		AFTIN-EXP-R1 -FX	
RFW#:	020		021		021 RE		022		023		024	
2,4,6-Trichlorophenol	25	U	250	U	250	U	250	U	620	U	250	U
2,4,5-Trichlorophenol	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
2-Chloronaphthalene	25	U	250	U	250	U	250	U	620	U	250	U
2-Nitroaniline	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
Dimethylphthalate	25	U	250	U	250	U	250	U	620	U	250	U
Acenaphthylene	25	U	250	U	250	U	250	U	620	U	250	U
2,6-Dinitrotoluene	25	U	250	U	250	U	250	U	620	U	250	U
3-Nitroaniline	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
Acenaphthene	25	U	250	U	250	U	250	U	620	U	250	U
2,4-Dinitrophenol	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
4-Nitrophenol	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
Dibenzofuran	25	U	250	U	250	U	250	U	620	U	250	U
2,4-Dinitrotoluene	25	U	250	U	250	U	250	U	620	U	250	U
Diethylphthalate	25	U	250	U	250	U	250	U	620	U	250	U
4-Chlorophenyl-phenylether	25	U	250	U	250	U	250	U	620	U	250	U
Fluorene	25	U	250	U	250	U	250	U	620	U	250	U
4-Nitroaniline	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
4,6-Dinitro-2-methylphenol	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
N-Nitrosodiphenylamine (1)	25	U	250	U	250	U	250	U	620	U	250	U
4-Bromophenyl-phenylether	25	U	250	U	250	U	250	U	620	U	250	U
Hexachlorobenzene	25	U	250	U	250	U	250	U	620	U	250	U
Pentachlorophenol	120	U	1200	U	1200	U	1200	U	3100	U	1200	U
Phenanthrene	25	U	250	U	250	U	250	U	620	U	250	U
Anthracene	25	U	250	U	250	U	250	U	620	U	250	U
Di-n-Butylphthalate	25	U	250	U	250	U	250	U	620	U	250	U
Fluoranthene	25	U	250	U	250	U	250	U	620	U	250	U
Pyrene	25	U	250	U	250	U	250	U	620	U	250	U
Butylbenzylphthalate	25	U	250	U	250	U	250	U	620	U	250	U
3,3'-Dichlorobenzidine	50	U	500	U	500	U	500	U	1200	U	500	U
Benzo(a)anthracene	25	U	250	U	250	U	250	U	620	U	250	U
Chrysene	25	U	250	U	250	U	250	U	620	U	250	U
bis(2-Ethylhexyl)phthalate	9	JB	250	U	250	U	250	U	620	U	39	J
Di-n-Octyl phthalate	25	U	250	U	250	U	250	U	620	U	250	U
Benzo(b)fluoranthene	25	U	250	U	250	U	250	U	620	U	250	U
Benzo(k)fluoranthene	25	U	250	U	250	U	250	U	620	U	250	U
Benzo(a)pyrene	25	U	250	U	250	U	250	U	620	U	250	U
Indeno(1,2,3-cd)pyrene	25	U	250	U	250	U	250	U	620	U	250	U
Dibenzo(a,h)anthracene	25	U	250	U	250	U	250	U	620	U	250	U
Benzo(g,h,i)perylene	25	U	250	U	250	U	250	U	620	U	250	U
Carbazole	25	U	250	U	250	U	250	U	620	U	250	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List

Report Date: 02/21/96 16:14

RFW Batch Number: 9602L916   Client: COE-HOT GAS   Work Order: 02281012012   Page: 3a

	Cust ID:	AFTIN-EXP-R1 MS-FB	AFTIN-EXP-R1 MS-FX	SBLKSO	SBLKSO BS	SBLKSO BSD	SBLKSX
Sample	RFW#:	025	026	96LE0209-MB1	96LE0209-MB1	96LE0209-MB1	96LE0236-MB1
Information	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	2.50	25.0	2.50	2.50	2.50	2.50
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
	Nitrobenzene-d5	62 %	56 %	74 %	72 %	66 %	53 %
Surrogate	2-Fluorobiphenyl	72 %	67 %	75 %	82 %	77 %	67 %
Recovery	p-Terphenyl-d14	88 %	83 %	81 %	84 %	75 %	72 %
	Phenol-d5	60 %	55 %	19 * %	19 * %	17 * %	48 %
	2-Fluorophenol	97 %	98 %	46 %	36 %	31 %	79 %
	2,4,6-Tribromophenol	61 %	65 %	68 %	91 %	84 %	56 %

Compound	AFTIN-EXP-R1 MS-FB	fl	AFTIN-EXP-R1 MS-FX	fl	SBLKSO	fl	SBLKSO BS	fl	SBLKSO BSD	fl	SBLKSX	fl
Phenol	25	U	250	U	25	U	18 *	%	17 *	%	25	U
bis(2-Chloroethyl)ether	25	U	250	U	25	U	25	U	25	U	25	U
2-Chlorophenol	25	U	250	U	25	U	65	%	59	%	25	U
1,3-Dichlorobenzene	25	U	250	U	25	U	25	U	25	U	25	U
1,4-Dichlorobenzene	25	U	250	U	25	U	65	%	58	%	25	U
Benzyl alcohol	25	U	250	U	25	U	25	U	25	U	25	U
1,2-Dichlorobenzene	25	U	250	U	25	U	25	U	25	U	25	U
2-Methylphenol	25	U	250	U	25	U	25	U	25	U	25	U
bis(2-Chloroisopropyl)ether	25	U	250	U	25	U	25	U	25	U	25	U
4-Methylphenol	25	U	250	U	25	U	25	U	25	U	25	U
N-Nitroso-Di-n-propylamine	25	U	250	U	25	U	77	%	70	%	25	U
Hexachloroethane	25	U	250	U	25	U	25	U	25	U	25	U
Nitrobenzene	25	U	250	U	25	U	25	U	25	U	25	U
Isophorone	25	U	250	U	25	U	25	U	25	U	25	U
2-Nitrophenol	25	U	250	U	25	U	25	U	25	U	25	U
2,4-Dimethylphenol	25	U	250	U	25	U	25	U	25	U	25	U
Benzoic acid	120	U	1200	U	120	U	120	U	120	U	120	U
bis(2-Chloroethoxy)methane	25	U	250	U	25	U	25	U	25	U	25	U
2,4-Dichlorophenol	25	U	250	U	25	U	25	U	25	U	25	U
1,2,4-Trichlorobenzene	25	U	250	U	25	U	73	%	67	%	25	U
Naphthalene	25	U	250	U	25	U	25	U	25	U	25	U
4-Chloroaniline	25	U	250	U	25	U	25	U	25	U	25	U
Hexachlorobutadiene	25	U	250	U	25	U	25	U	25	U	25	U
4-Chloro-3-methylphenol	25	U	250	U	25	U	75	%	68	%	25	U
2-Methylnaphthalene	25	U	250	U	25	U	25	U	25	U	25	U
Hexachlorocyclopentadiene	25	U	250	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L916 Client: COE-HOT GAS Work Order: 02281012012 Page: 3b

013

Cust ID:	AFTIN-EXP-R1 MS-FB		AFTIN-EXP-R1 MS-FX		SBLKSO		SBLKSO BS		SBLKSO BSD		SBLKSX	
RFW#:	025		026		96LE0209-MB1		96LE0209-MB1		96LE0209-MB1		96LE0236-MB1	
2,4,6-Trichlorophenol	25	U	250	U	25	U	25	U	25	U	25	U
2,4,5-Trichlorophenol	120	U	1200	U	120	U	120	U	120	U	120	U
2-Chloronaphthalene	25	U	250	U	25	U	25	U	25	U	25	U
2-Nitroaniline	120	U	1200	U	120	U	120	U	120	U	120	U
Dimethylphthalate	25	U	250	U	25	U	25	U	25	U	25	U
Acenaphthylene	25	U	250	U	25	U	25	U	25	U	25	U
2,6-Dinitrotoluene	25	U	250	U	25	U	25	U	25	U	25	U
3-Nitroaniline	120	U	1200	U	120	U	120	U	120	U	120	U
Acenaphthene	25	U	250	U	25	U	74	%	69	%	25	U
2,4-Dinitrophenol	120	U	1200	U	120	U	120	U	120	U	120	U
4-Nitrophenol	120	U	1200	U	120	U	19	%	19	%	120	U
Dibenzofuran	25	U	250	U	25	U	25	U	25	U	25	U
2,4-Dinitrotoluene	25	U	250	U	25	U	82	%	76	%	25	U
Diethylphthalate	25	U	250	U	25	U	25	U	25	U	25	U
4-Chlorophenyl-phenylether	25	U	250	U	25	U	25	U	25	U	25	U
Fluorene	25	U	250	U	25	U	25	U	25	U	25	U
4-Nitroaniline	120	U	1200	U	120	U	120	U	120	U	120	U
4,6-Dinitro-2-methylphenol	120	U	1200	U	120	U	120	U	120	U	120	U
N-Nitrosodiphenylamine (1)	25	U	250	U	25	U	25	U	25	U	25	U
4-Bromophenyl-phenylether	25	U	250	U	25	U	25	U	25	U	25	U
Hexachlorobenzene	25	U	250	U	25	U	25	U	25	U	25	U
Pentachlorophenol	120	U	1200	U	3	J	78	%	82	%	120	U
Phenanthrene	25	U	250	U	25	U	25	U	25	U	25	U
Anthracene	25	U	250	U	25	U	25	U	25	U	25	U
Di-n-Butylphthalate	25	U	250	U	25	U	25	U	25	U	25	U
Fluoranthene	25	U	250	U	25	U	25	U	25	U	25	U
Pyrene	25	U	250	U	25	U	77	%	68	%	25	U
Butylbenzylphthalate	25	U	250	U	25	U	25	U	25	U	25	U
3,3'-Dichlorobenzidine	50	U	500	U	50	U	50	U	50	U	50	U
Benzo(a)anthracene	25	U	250	U	25	U	25	U	25	U	25	U
Chrysene	25	U	250	U	25	U	25	U	25	U	25	U
bis(2-Ethylhexyl)phthalate	4	J	36	J	7	J	13	JB	25	U	25	U
Di-n-Octyl phthalate	25	U	250	U	25	U	25	U	25	U	25	U
Benzo(b)fluoranthene	25	U	250	U	25	U	25	U	25	U	25	U
Benzo(k)fluoranthene	25	U	250	U	25	U	25	U	25	U	25	U
Benzo(a)pyrene	25	U	250	U	25	U	25	U	25	U	25	U
Indeno(1,2,3-cd)pyrene	25	U	250	U	25	U	25	U	25	U	25	U
Dibenzo(a,h)anthracene	25	U	250	U	25	U	25	U	25	U	25	U
Benzo(g,h,i)perylene	25	U	250	U	25	U	25	U	25	U	25	U
Carbazole	25	U	250	U	25	U	25	U	25	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List
Report Date: 02/21/96 16:11
RFW Batch Number: **9602L916** Client: **COE-HOT GAS** Work Order: 02281012012 Page: 4a

	Cust ID:	SBLKSX BS		SBLKSX BSD	
Sample Information	RFW#:	96LE0236-MB1		96LE0236-MB1	
	Matrix:	AIR		AIR	
	D.F.:	2.50		2.50	
	Units:	total ug		total ug	
Surrogate Recovery	Nitrobenzene-d5	71	%	70	%
	2-Fluorobiphenyl	89	%	89	%
	p-Terphenyl-d14	94	%	89	%
	Phenol-d5	62	%	63	%
	2-Fluorophenol	102	%	105	%
	2,4,6-Tribromophenol	74	%	71	%
Phenol		51	%	51	%
bis(2-Chloroethyl)ether		25	U	25	U
2-Chlorophenol		66	%	65	%
1,3-Dichlorobenzene		25	U	25	U
1,4-Dichlorobenzene		55	%	57	%
Benzyl alcohol		25	U	25	U
1,2-Dichlorobenzene		25	U	25	U
2-Methylphenol		25	U	25	U
bis(2-Chloroisopropyl)ether		25	U	25	U
4-Methylphenol		25	U	25	U
N-Nitroso-Di-n-propylamine		63	%	62	%
Hexachloroethane		25	U	25	U
Nitrobenzene		25	U	25	U
Isophorone		25	U	25	U
2-Nitrophenol		25	U	25	U
2,4-Dimethylphenol		25	U	25	U
Benzoic acid		120	U	120	U
bis(2-Chloroethoxy)methane		25	U	25	U
2,4-Dichlorophenol		25	U	25	U
1,2,4-Trichlorobenzene		65	%	66	%
Naphthalene		25	U	25	U
4-Chloroaniline		25	U	25	U
Hexachlorobutadiene		25	U	25	U
4-Chloro-3-methylphenol		77	%	75	%
2-Methylnaphthalene		25	U	25	U
Hexachlorocyclopentadiene		25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L916 Client: COE-HOT GAS Work Order: 02281012012 Page: 4b

015

Cust ID:	SBLKSX BS		SBLKSX BSD	
RFW#:	96LE0236-MB1		96LE0236-MB1	
2,4,6-Trichlorophenol	25	U	25	U
2,4,5-Trichlorophenol	120	U	120	U
2-Chloronaphthalene	25	U	25	U
2-Nitroaniline	120	U	120	U
Dimethylphthalate	25	U	25	U
Acenaphthylene	25	U	25	U
2,6-Dinitrotoluene	25	U	25	U
3-Nitroaniline	120	U	120	U
Acenaphthene	76	%	75	%
2,4-Dinitrophenol	120	U	120	U
4-Nitrophenol	54	%	58	%
Dibenzofuran	25	U	25	U
2,4-Dinitrotoluene	77	%	76	%
Diethylphthalate	25	U	25	U
4-Chlorophenyl-phenylether	25	U	25	U
Fluorene	25	U	25	U
4-Nitroaniline	120	U	120	U
4,6-Dinitro-2-methylphenol	120	U	120	U
N-Nitrosodiphenylamine (1)	25	U	25	U
4-Bromophenyl-phenylether	25	U	25	U
Hexachlorobenzene	25	U	25	U
Pentachlorophenol	83	%	82	%
Phenanthrene	25	U	25	U
Anthracene	25	U	25	U
Di-n-Butylphthalate	25	U	25	U
Fluoranthene	25	U	25	U
Pyrene	81	%	76	%
Butylbenzylphthalate	25	U	25	U
3,3'-Dichlorobenzidine	50	U	50	U
Benzo(a)anthracene	25	U	25	U
Chrysene	25	U	25	U
bis(2-Ethylhexyl)phthalate	25	U	25	U
Di-n-Octyl phthalate	25	U	25	U
Benzo(b)fluoranthene	25	U	25	U
Benzo(k)fluoranthene	25	U	25	U
Benzo(a)pyrene	25	U	25	U
Indeno(1,2,3-cd)pyrene	25	U	25	U
Dibenzo(a,h)anthracene	25	U	25	U
Benzo(g,h,i)perylene	25	U	25	U
Carbazole	25	U	25	U

(1) Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

WESTON

CASE NARRATIVE

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW# : 9602L916

W.O. #: 02281-012-012-1200-00
Date Received: 02 February 1996

SEMIVOLATILE

The set of samples consisted of four (4) air samples collected on 31 January 1996 and 01 February 1996. Each sampling train consisted of three fractions: condensate, solid (filter/XAD), and solvent; each fraction was analyzed and reported individually.

These samples were prepared for Method 8330 analyses on 07 and 08 February 1996; processed for Method 8270 on 09 and 14 February (see item 1), and analyzed according to criteria set forth in SW 846 Method 8270 for TCL Semivolatile target compounds on 11,12,15 and 17 February 1996.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. Four (4) mL portions of the 8330 Acetonitrile extracts were spiked with Semivolatile surrogates and partitioned into Methylenechloride. Due to the presence of Acetonitrile in the initial extracts, poor chromatography was observed in the Semivolatile analysis for samples AFTOUT-EXP/SV-R1-CND, IN/OUT-EXP/SV-SB-CND, AFTOUT-EXP/SV-R1-FX and IN/OUT -EXP/SV-SB-FX. Two extracts (AFT/OUT-EXP/SV-R1-CND and AFTOUT-EXP/SV-R1-FX) were concentrated to near dryness and brought back up to volume with Dichloromethane in an attempt to remove more of the Acetonitrile. These extracts were analyzed with improved chromatography and reported as reanalyses for confirmation of the results. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

2. All required holding times for extraction and analysis were met.

3. Non-target compounds were detected in these samples.

4. Three (3) of one-hundred-twenty (120) surrogate recoveries were outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met {i.e., no more than one outlier per fraction (acid and base neutral) and no recoveries less than 10%}.

5. Two (2) of forty-four (44) blank spike recoveries were outside EPA QC limits.

6. The method blank 96LE0209-MB1 contained the target compound Pentachlorophenol and the common contaminant Bis (2-Ethylhexyl)phthalate at levels less than the CRQL.

7. Internal standard area criteria were not met for samples AFTIN-EXP-R1-FX and AFTIN-EXP-R1MS-FX. The GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly and all surrogate recoveries were within QC limits; consequently, samples were not reanalyzed.

8. The sample IDs for this set of samples were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters on Organic CLP forms.

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-22-96
Date

sb/bna/02-916b.cn

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GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna

WESTON

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

mmz\10-94\gloss.bna

WESTON

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP	-	Missed Peak: manually added peak not found by automatic quan program.
PA	-	Peak Assignment: quan report was changed to reflect correct peak assignment.
RI	-	Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
SP	-	Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
CB	-	Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
PI	-	Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

RFW 21-21-035/A-08/93

WESTON® Sample Discrepancy Report (SDR) SDR #: 96M5030

Initiator: Deb Feick RFW Batch: 9602L916, 963 Parameter: 0625H
Date: 2/14/96 Samples: see below Matrix: air water
Client: COE-Hot Gas Method: SW846/MCAWW/CLP/ Prep Batch: 95LE0309

1. Reason for SDR

a. COC Discrepancy
__ Tech Profile Error
__ Transcription Error
__ Client Request
__ Wrong Test Code
__ Sampler Error on C-O-C
__ Other ____

b. General Discrepancy
__ Missing Sample/Extract*
__ Hold Time Exceeded
__ Improper Bottle Type
__ Container Broken
__ Insufficient Sample*
__ Not Amenable to Analysis
__ Wrong Sample Pulled
__ Preservation Wrong
__ Label ID's Illegible
__ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ____

c. QC Problem (include all relevant specific results; attach data if necessary) FYI - due to initial extraction for HPLC with ~~Acetonitrile~~ acetonitrile the following samples had poor chromatography: 9602L916-004, 009, 021, 020; 9602L963-004, 009, 014, 027, 029, 031. Each internal + surrogate in these samples was split into 2 or 3 peaks. See attached.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: ____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ____
__ Place On/Take Off Hold (circle)

Other Description:
1. Sum split peaks and report total % recovery.
2. Bring up remaining extract in a volume of DCM and re-concentrate + reanalyze.

4. Project Manager Instructions...signature/date: [signature] 2/14/96

X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
__ Date/Person ____
__ Add
__ Cancel

Concur with 1.
2. Attempt to exchange samples 916-004, 021 (and 020 if necessary) to DCM only and reanalyze. Please have Kevin Meenan talk to OSPIL on the procedure. [initials] 2/14/96

5. Final Action...signature/date: ____

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation: reported the "exchanged" extracts for samples 9602L916-004 and 9602L916-021 as reanalyses for confirmation. noted in narrative [illegible]

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
	X Initiator Deb Feick		__ Metals: Reichner/Doughty
	X Lab Manager: J. Michael Taylor		__ Inorganic: Perrone/Leonards
1	X Project Mgr: Kelly Baker		__ GC/LC: Jarvis/Skrzat/Schnell
2, 3	X Section Mgr: Siery/Durkee/Daniels		~~MS~~: LeMin/McIntyre/Taylor/Kasdras/Steele
	X QA Section Mgr: Dianne Therry		__ Log-in: Geiger
	X QA File: Feldman/Racioppi/Shaffer		__ EDD: Miller
	X Data Reporting: Som Basuthakur		__ Admin: Brewer/Keehn/Edgington
	✓ Sample Prep: Osei-Mensah/Swisher		__ Other: ____

Sample Discrepancy Report (SDR) SDR #: [illegible]

Initiator: K. Baker RFW Batch: 9602L963, 916 Parameter: SVOA
Date: 2-9-96 Samples: see below Matrix: Air
Client: COE-HOT GAS Method: SW846 MCAWW CLP Prep Batch:

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Transcription Error __ Client Request __ Wrong Test Code __ Sampler Error on C-O-C __ Other

b. General Discrepancy
__ Missing Sample/Extract* __ Hold Time Exceeded __ Improper Bottle Type __ Container Broken __ Insufficient Sample* __ Not Amenable to Analysis __ Wrong Sample Pulled __ Preservation Wrong __ Label ID's Illegible __ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date:

c. QC Problem (Include all relevant specific results; attach data if necessary)

Add 0625 to the following samples.
9602L916 - 13, 18, 23, 24, 25, 26
9602L963 - 19, 24, 32, 33, 34, 35

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

X Re-log
Entire Batch
X Following Samples: See above
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to
__ Place On/Take Off Hold (circle)

4. Project Manager Instructions...signature/date: K Baker 2/9/96
X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
X Client Contacted:
Date/Person Colleen Parker 2/9/96
__ Add
__ Cancel

5. Final Action...signature/date: 092 12 96 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr:	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other:

RFW 21-21-006/E-03/95

WESTON® Sample Discrepancy Report (SDR) SDR #: 7IAM 0070

Initiator: K. Baker RFW Batch: 9602L916, 943 Parameter: All
Date: 2-14-96 Samples: All Matrix: AIR
Client: AARP HotGas Method: SW846/MCAWW/CLP Prep Batch: ______

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Transcription Error __ Client Request __ Wrong Test Code __ Sampler Error on C-O-C. X Other Wrong matrix

b. General Discrepancy
__ Missing Sample/Extract*
__ Hold Time Exceeded
__ Improper Bottle Type
__ Container Broken*
__ Insufficient Sample*
__ Not Amenable to Analysis
__ Wrong Sample Pulled
__ Preservation Wrong
__ Label ID's Illegible
__ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

c. QC Problem (Include all relevant specific results; attach data if necessary)

ALL matrices should be air.
please change all samples listed as water to air.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples: ______
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ______
__ Place On/Take Off Hold (circle)

Other Description:
X change matrix where appropriate to air.

4. Project Manager Instructions...signature/date: KBaker 2/14/96
X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person ______
__ Add
__ Cancel

5. Final Action...signature/date: DMoore 2/15/96 Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr: ______	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ______

WESTON

QC SUMMARY

2D

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot No.: 9602L916

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	AFTOUT-EXP/SV-R1-CND	68	66	110	57	78	86		0
02	AFTOUT-EXP/SV-R1-CNDRE	48	54	93	41	43	59		0
03	IN/OUT-EXP/SV-SB-ACE	79	74	96	70	98	79		0
04	IN/OUT-EXP/SV-SB-CND	55	58	88	46	63	75		0
05	AFTIN-EXP-R1-CND	38	69	77	41	86	60		0
06	AFTIN-EXP-R1MS-CND	62	75	82	64	109	68		0
07	AFTOUT-EXP/SV-R1-FB	47	52	83	40	53	75		0
08	AFTOUT-EXP/SV-R1-FX	68	61	85	55	74	83		0
09	AFTOUT-EXP/SV-R1-FXRE	43	42	87	33	33	56		0
10	IN/OUT-EXP/SV-SB-FX	71	72	84	48	69	61		0
11	AFTIN-EXP-R1-FB	40	82	76	55	104	62		0
12	AFTIN-EXP-R1-FX	56	71	79	60	99	67		0
13	AFTIN-EXP-R1MS-FB	62	72	88	60	97	61		0
14	AFTIN-EXP-R1MS-FX	56	67	83	55	98	65		0
15	SBLKSOLE0209-MB1	74	75	81	19 *	46	68		1
16	SBLKSOLE0209-MB1 BS	72	82	84	19 *	36	91		1
17	SBLKSOLE0209-MB1 BSD	66	77	75	17 *	31	84		1
18	SBLKSXLE0236-MB1	53	67	72	48	79	56		0
19	SBLKSXLE0236-MB1 BS	71	89	94	62	102	74		0
20	SBLKSXLE0236-MB1 BSD	70	89	89	63	105	71		0

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(23-120)
S2 (FBP)	= 2-Fluorobiphenyl	(30-115)
S3 (TPH)	= p-Terphenyl-d14	(18-137)
S4 (PHL)	= Phenol-d5	(24-113)
S5 (2FP)	= 2-Fluorophenol	(25-121)
S6 (TBP)	= 2,4,6-Tribromophenol	(19-122)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

3D

SOIL SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot No.: 9602L916

BLANK Spike - Sample No.: SBLKSOLE0209-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC #	QC LIMITS REC
Phenol	250	0	44.9	18 *	26 - 90
2-Chlorophenol	250	0	163	65	25 -102
1,4-Dichlorobenzene	125	0	80.7	65	28 -104
N-Nitroso-Di-n-propylamine	125	0	96.2	77	41 -126
1,2,4-Trichlorobenzene	125	0	90.7	73	38 -107
4-Chloro-3-methylphenol	250	0	187	75	26 -103
Acenaphthene	125	0	93.1	75	31 -137
4-Nitrophenol	250	0	47.2	19	11 -114
2,4-Dinitrotoluene	125	0	102	82	28 - 89
Pentachlorophenol	250	3.32	199	78	17 -109
Pyrene	125	0	96.8	77	35 -142

COMPOUND	SPIKE ADDED UG/L	BSD CONCENTRATION UG/L	BSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	250	41.4	17 *	5	35	26 - 90
2-Chlorophenol	250	149	59	9	50	25 -102
1,4-Dichlorobenzene	125	72.9	58	11	27	28 -104
N-Nitroso-Di-n-propylamine	125	87.6	70	9	38	41 -126
1,2,4-Trichlorobenzene	125	84.0	67	8	23	38 -107
4-Chloro-3-methylphenol	250	171	68	9	33	26 -103
Acenaphthene	125	86.8	69	8	19	31 -137
4-Nitrophenol	250	48.2	19	0	50	11 -114
2,4-Dinitrotoluene	125	94.6	76	7	47	28 - 89
Pentachlorophenol	250	208	82	5	47	17 -109
Pyrene	125	85.4	68	12	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 2 out of 22 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS   RFW Lot No.: 9602L916

BLANK Spike - Sample No.: SBLKSXLE0236-MB1   Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
Phenol	250	0	126	51	26 - 90
2-Chlorophenol	250	0	164	66	25 -102
1,4-Dichlorobenzene	125	0	68.3	55	28 -104
N-Nitroso-Di-n-propylamine	125	0	78.4	63	41 -126
1,2,4-Trichlorobenzene	125	0	81.2	65	38 -107
4-Chloro-3-methylphenol	250	0	194	77	26 -103
Acenaphthene	125	0	95.2	76	31 -137
4-Nitrophenol	250	0	136	54	11 -114
2,4-Dinitrotoluene	125	0	95.7	77	28 - 89
Pentachlorophenol	250	0	207	83	17 -109
Pyrene	125	0	101	81	35 -142

COMPOUND	SPIKE ADDED UG/KG	BSD CONCENTRATION UG/KG	BSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	250	129	51	0	35	26 - 90
2-Chlorophenol	250	163	65	1	50	25 -102
1,4-Dichlorobenzene	125	71.4	57	3	27	28 -104
N-Nitroso-Di-n-propylamine	125	78.1	62	1	38	41 -126
1,2,4-Trichlorobenzene	125	82.6	66	1	23	38 -107
4-Chloro-3-methylphenol	250	187	75	2	33	26 -103
Acenaphthene	125	93.8	75	1	19	31 -137
4-Nitrophenol	250	145	58	7	50	11 -114
2,4-Dinitrotoluene	125	94.6	76	1	47	28 - 89
Pentachlorophenol	250	205	82	1	47	17 -109
Pyrene	125	95.0	76	6	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS:

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021103

Lab Sample ID: 96LE0209-MB1

Date Extracted: 02/09/96

Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 02/11/96

Time Analyzed: 1123

Matrix:(Soil/Water) AIR

Level:(low/med) LOW

Instrument ID: 4500V

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	AFTOUT-EXP/SV-R1-CNDRE	9602L916-004	M021503	02/15/96
02	AFTOUT-EXP/SV-R1-FXRE	9602L916-021	M021504	02/15/96
03	SBLKSOLE0209-MB1 BS	96LE0209-MB1S	V021104	02/11/96
04	SBLKSOLE0209-MB1 BSD	96LE0209-MB1T	V021105	02/11/96
05	AFTOUT-EXP/SV-R1-CND	9602L916-004	V021106	02/11/96
06	IN/OUT-EXP/SV-SB-CND	9602L916-009	V021108	02/11/96
07	AFTOUT-EXP/SV-R1-FB	9602L916-020	V021109	02/11/96
08	AFTOUT-EXP/SV-R1-FX	9602L916-021	V021110	02/11/96
09	IN/OUT-EXP/SV-SB-FX	9602L916-022	V021111	02/11/96
10	IN/OUT-EXP/SV-SB-ACE	9602L916-006	V021211	02/12/96

COMMENTS:

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021703   Lab Sample ID: 96LE0236-MB1

Date Extracted: 02/14/96   Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 02/17/96   Time Analyzed: 1113

Matrix:(Soil/Water) AIR   Level:(low/med) LOW

Instrument ID: 4500V

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLKSXLE0236-MB1 BS	96LE0236-MB1S	V021704	02/17/96
02	SBLKSXLE0236-MB1 BSD	96LE0236-MB1T	V021705	02/17/96
03	AFTIN-EXP-R1-CND	9602L916-013	V021706	02/17/96
04	AFTIN-EXP-R1MS-CND	9602L916-018	V021707	02/17/96
05	AFTIN-EXP-R1-FB	9602L916-023	V021708	02/17/96
06	AFTIN-EXP-R1-FX	9602L916-024	V021709	02/17/96
07	AFTIN-EXP-R1MS-FB	9602L916-025	V021710	02/17/96
08	AFTIN-EXP-R1MS-FX	9602L916-026	V021711	02/17/96

COMMENTS:

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: M021403   DFTPP Injection Date: 02/14/96

Instrument ID: 5100m   DFTPP Injection Time: 1654

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	44.8
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	58.5
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	51.2
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	5.3
275	10.0 - 30.0% of mass 198	20.8
365	Greater than 1.00% of mass 198	1.35
441	Present, but less than mass 443	7.2
442	Greater than 40.0% of mass 198	64.4
443	17.0 - 23.0% of mass 442	11.6 (18.0)2

1-Value is % mass 69   2-Value is % mass 442

OK
DAF
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	M021404	02/14/96	1729
02	SSTD80	SSTD80	M021405	02/14/96	1817
03	SSTD120	SSTD120	M021406	02/14/96	1904
04	SSTD160	SSTD160	M021407	02/14/96	1952
05	SSTD20	SSTD20	M021408	02/14/96	2039
06					
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20					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: M021501 DFTPP Injection Date: 02/15/96

Instrument ID: 5100m DFTPP Injection Time: 1314

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	49.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	62.0
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	52.4
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	5.1
275	10.0 - 30.0% of mass 198	21.2
365	Greater than 1.00% of mass 198	1.32
441	Present, but less than mass 443	7.7
442	Greater than 40.0% of mass 198	64.8
443	17.0 - 23.0% of mass 442	11.9 (18.3)2

1-Value is % mass 69 2-Value is % mass 442

OK
[illegible] 2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	M021502	02/15/96	1348
02	AFTOUT-EXP/SV-R1-CNDRE	9602L916-004	M021503	02/15/96	1522
03	AFTOUT-EXP/SV-R1-FXRE	9602L916-021	M021504	02/15/96	1609
04					
05					
06					
07					
08					
09					
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V020801 DFTPP Injection Date: 02/08/96

Instrument ID: 4500V DFTPP Injection Time: 0830

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	55.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	63.2
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	53.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.1
275	10.0 - 30.0% of mass 198	26.9
365	Greater than 1.00% of mass 198	4.52
441	Present, but less than mass 443	7.2
442	Greater than 40.0% of mass 198	61.2
443	17.0 - 23.0% of mass 442	11.8 (19.3)2

1-Value is % mass 69 2-Value is % mass 442

ok DAf 2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V020802	02/08/96	0908
02	SSTD80	SSTD80	V020803	02/08/96	1108
03	SSTD120	SSTD120	V020804	02/08/96	1157
04	SSTD160	SSTD160	V020805	02/08/96	1246
05	SSTD20	SSTD20	V020806	02/08/96	1336
06					
07					
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20					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021101 DFTPP Injection Date: 02/11/96

Instrument ID: 4500V DFTPP Injection Time: 0854

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	42.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	44.0
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	46.2
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	23.5
365	Greater than 1.00% of mass 198	2.97
441	Present, but less than mass 443	5.8
442	Greater than 40.0% of mass 198	47.1
443	17.0 - 23.0% of mass 442	9.0 (19.1)2

1-Value is % mass 69 2-Value is % mass 442

OK
DAT
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021102	02/11/96	0941
02	SBLKSOLE0209-MB1	96LE0209-MB1	V021103	02/11/96	1123
03	SBLKSOLE0209-MB1 BS	96LE0209-MB1S	V021104	02/11/96	1212
04	SBLKSOLE0209-MB1 BSD	96LE0209-MB1T	V021105	02/11/96	1301
05	AFTOUT-EXP/SV-R1-CND	9602L916-004	V021106	02/11/96	1350
06	IN/OUT-EXP/SV-SB-CND	9602L916-009	V021108	02/11/96	1528
07	AFTOUT-EXP/SV-R1-FB	9602L916-020	V021109	02/11/96	1618
08	AFTOUT-EXP/SV-R1-FX	9602L916-021	V021110	02/11/96	1707
09	IN/OUT-EXP/SV-SB-FX	9602L916-022	V021111	02/11/96	1756
10					
11					
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16					
17					
18					
19					
20					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021201 DFTPP Injection Date: 02/12/96

Instrument ID: 4500V DFTPP Injection Time: 0920

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	36.2
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	42.4
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	44.5
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.4
275	10.0 - 30.0% of mass 198	23.5
365	Greater than 1.00% of mass 198	2.96
441	Present, but less than mass 443	5.4
442	Greater than 40.0% of mass 198	43.0
443	17.0 - 23.0% of mass 442	8.6 (20.0)2

1-Value is % mass 69 2-Value is % mass 442

Ok
DA
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021202	02/12/96	0956
02	SSTD80	SSTD80	V021203	02/12/96	1119
03	SSTD120	SSTD120	V021204	02/12/96	1208
04	SSTD160	SSTD160	V021205	02/12/96	1558
05	SSTD20	SSTD20	V021206	02/12/96	1648
06					
07					
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16					
17					
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19					
20					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021207 DFTPP Injection Date: 02/12/96

Instrument ID: 4500V DFTPP Injection Time: 1750

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	30.8
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	37.4
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	41.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.0
275	10.0 - 30.0% of mass 198	25.6
365	Greater than 1.00% of mass 198	3.41
441	Present, but less than mass 443	7.3
442	Greater than 40.0% of mass 198	58.4
443	17.0 - 23.0% of mass 442	10.9 (18.7)2

1-Value is % mass 69 2-Value is % mass 442

Ok
DAT
2/22/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021208	02/12/96	1824
02	IN/OUT-EXP/SV-SB-ACE	9602L916-006	V021211	02/12/96	2123
03					
04					
05					
06					
07					
08					
09					
10					
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20					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021601 DFTPP Injection Date: 02/16/96

Instrument ID: 4500V DFTPP Injection Time: 0926

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	39.9
68	Less than 2.0% of mass 69	0.6 (1.3)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	55.2
197	Less than 1.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.6
275	10.0 - 30.0% of mass 198	28.3
365	Greater than 1.00% of mass 198	5.50
441	Present, but less than mass 443	12.2
442	Greater than 40.0% of mass 198	93.2
443	17.0 - 23.0% of mass 442	17.7 (19.0)2

1-Value is % mass 69 2-Value is % mass 442

OK DH 2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021602	02/16/96	1010
02	SSTD80	SSTD80	V021603	02/16/96	1148
03	SSTD120	SSTD120	V021604	02/16/96	1237
04	SSTD160	SSTD160	V021605	02/16/96	1326
05	SSTD20	SSTD20	V021606	02/16/96	1416
06					
07					
08					
09					
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13					
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15					
16					
17					
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19					
20					

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021701 DFTPP Injection Date: 02/17/96

Instrument ID: 4500V DFTPP Injection Time: 0849

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	33.2
68	Less than 2.0% of mass 69	0.7 (1.4)1
69	Mass 69 relative abundance	45.6
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	52.9
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.2
275	10.0 - 30.0% of mass 198	29.1
365	Greater than 1.00% of mass 198	5.46
441	Present, but less than mass 443	10.9
442	Greater than 40.0% of mass 198	83.5
443	17.0 - 23.0% of mass 442	16.1 (19.3)2

1-Value is % mass 69 2-Value is % mass 442

OK
DA
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021702	02/17/96	0923
02	SBLKSXLE0236-MB1	96LE0236-MB1	V021703	02/17/96	1113
03	SBLKSXLE0236-MB1 BS	96LE0236-MB1S	V021704	02/17/96	1201
04	SBLKSXLE0236-MB1 BSD	96LE0236-MB1T	V021705	02/17/96	1251
05	AFTIN-EXP-R1-CND	9602L916-013	V021706	02/17/96	1340
06	AFTIN-EXP-R1MS-CND	9602L916-018	V021707	02/17/96	1429
07	AFTIN-EXP-R1-FB	9602L916-023	V021708	02/17/96	1519
08	AFTIN-EXP-R1-FX	9602L916-024	V021709	02/17/96	1607
09	AFTIN-EXP-R1MS-FB	9602L916-025	V021710	02/17/96	1657
10	AFTIN-EXP-R1MS-FX	9602L916-026	V021711	02/17/96	1746
11					
12					
13					
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8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS   RFW Lot: 9602L916

Lab File ID (Standard): M021502   Date Analyzed: 02/15/96

Instrument ID: 5100m   Time Analyzed: 1348

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	11724	8.733	46368	11.733	23101	16.167
	UPPER LIMIT	23448	9.23	92736	12.23	46202	16.67
	LOWER LIMIT	5862	8.23	23184	11.23	11551	15.67
	CLIENT SAMPLE NO.						
01	AFTOUT-EXP/SV-R1-CNDRE	16667	8.733	63038	11.733	32288	16.167
02	AFTOUT-EXP/SV-R1-FXRE	15599	8.650	58227	11.700	33092	16.150

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L916

Lab File ID (Standard): M021502

Date Analyzed: 02/15/96

Instrument ID: 5100m

Time Analyzed: 1348

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	33003	19.833	28934	25.650	24669	30.567
	UPPER LIMIT	66006	20.33	57868	26.15	49338	31.07
	LOWER LIMIT	16502	19.33	14467	25.15	12335	30.07
	CLIENT SAMPLE NO.						
01	AFTOUT-EXP/SV-R1-CNDRE	44550	19.833	32423	25.650	27966	30.550
02	AFTOUT-EXP/SV-R1-FXRE	46465	19.833	35451	25.650	32307	30.567

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L916

Lab File ID (Standard): V021102 Date Analyzed: 02/11/96

Instrument ID: 4500V Time Analyzed: 0941

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	26253	9.000	118200	12.933	72624	18.533
	UPPER LIMIT	52506	9.50	236400	13.43	145248	19.03
	LOWER LIMIT	13127	8.50	59100	12.43	36312	18.03
	CLIENT SAMPLE NO.						
01	AFTOUT-EXP/SV-R1-CND	37211	8.950	142497	12.900	101617	18.517
02	IN/OUT-EXP/SV-SB-CND	39103	8.933	144103	12.900	98983	18.533
03	AFTOUT-EXP/SV-R1-FB	36097	8.967	141154	12.917	92898	18.533
04	AFTOUT-EXP/SV-R1-FX	37937	8.967	137817	12.917	97438	18.533
05	IN/OUT-EXP/SV-SB-FX	35651	8.967	128505	12.900	90892	18.517
06	SBLKSOLE0209-MB1	34581	9.317	115633	13.050	75023	18.567
07	SBLKSOLE0209-MB1 BS	23976	8.967	124180	12.917	87110	18.533
08	SBLKSOLE0209-MB1 BSD	24764	8.967	129296	12.917	88401	18.533

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

FORM VIII SV-1 5/88 Rev.

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L916

Lab File ID (Standard): V021102 Date Analyzed: 02/11/96

Instrument ID: 4500V Time Analyzed: 0941

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	110253	23.183	74447	29.383	59131	33.267
	UPPER LIMIT	220506	23.68	148894	29.88	118262	33.77
	LOWER LIMIT	55127	22.68	37224	28.88	29566	32.77
	CLIENT SAMPLE NO.						
01	AFTOUT-EXP/SV-R1-CND	154214	23.167	101178	29.433	96692	33.317
02	IN/OUT-EXP/SV-SB-CND	162166	23.183	134376	29.433	112177	33.300
03	AFTOUT-EXP/SV-R1-FB	155324	23.183	127222	29.417	107680	33.317
04	AFTOUT-EXP/SV-R1-FX	162708	23.183	131866	29.400	104422	33.283
05	IN/OUT-EXP/SV-SB-FX	147418	23.167	106408	29.350	88164	33.233
06	SBLKSOLE0209-MB1	106581	23.200	102250	29.450	86605	33.350
07	SBLKSOLE0209-MB1 BS	138053	23.167	120368	29.333	103835	33.217
08	SBLKSOLE0209-MB1 BSD	138599	23.167	128902	29.367	110335	33.267

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L916

Lab File ID (Standard): V021208

Date Analyzed: 02/12/96

Instrument ID: 4500V

Time Analyzed: 1824

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	19691	9.050	82475	12.917	50959	18.500
	UPPER LIMIT	39382	9.55	164950	13.42	101918	19.00
	LOWER LIMIT	9846	8.55	41238	12.42	25480	18.00
	CLIENT SAMPLE NO.						
01	IN/OUT-EXP/SV-SB-ACE	21604	8.933	79463	12.883	56795	18.500

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS   RFW Lot: 9602L916

Lab File ID (Standard): V021208   Date Analyzed: 02/12/96

Instrument ID: 4500V   Time Analyzed: 1824

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	77240	23.133	59629	29.467	49011	33.383
	UPPER LIMIT	154480	23.63	119258	29.97	98022	33.88
	LOWER LIMIT	38620	22.63	29815	28.97	24506	32.88
	CLIENT SAMPLE NO.						
01	IN/OUT-EXP/SV-SB-ACE	97411	23.150	82588	29.433	73199	33.317

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L916

Lab File ID (Standard): V021702

Date Analyzed: 02/17/96

Instrument ID: 4500V

Time Analyzed: 0923

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	15343	9.033	79377	12.933	55942	18.517
	UPPER LIMIT	30686	9.53	158754	13.43	111884	19.02
	LOWER LIMIT	7672	8.53	39689	12.43	27971	18.02
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R1-CND	21150	8.950	99674	12.900	67929	18.517
02	AFTIN-EXP-R1MS-CND	29984	8.950	118283	12.883	76106	18.500
03	AFTIN-EXP-R1-FB	20986	8.950	104086	12.900	72354	18.517
04	AFTIN-EXP-R1-FX	38246*	8.950	153710	12.900	89695	18.500
05	AFTIN-EXP-R1MS-FB	32409*	8.933	122007	12.883	80825	18.517
06	AFTIN-EXP-R1MS-FX	27908	8.933	106449	12.883	77833	18.500
07	SBLKSXLE0236-MB1	16389	9.050	92732	12.933	66762	18.500
08	SBLKSXLE0236-MB1 BS	18152	8.950	97286	12.900	67158	18.500
09	SBLKSXLE0236-MB1 BSD	20937	8.933	110507	12.883	74066	18.500

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS   RFW Lot: 9602L916

Lab File ID (Standard): V021702   Date Analyzed: 02/17/96

Instrument ID: 4500V   Time Analyzed: 0923

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	99241	23.150	90900	29.350	70658	33.217
	UPPER LIMIT	198482	23.65	181800	29.85	141316	33.72
	LOWER LIMIT	49621	22.65	45450	28.85	35329	32.72
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R1-CND	111663	23.183	104726	29.350	112428	33.233
02	AFTIN-EXP-R1MS-CND	119173	23.167	129699	29.367	131748	33.250
03	AFTIN-EXP-R1-FB	114352	23.183	118646	29.367	120693	33.250
04	AFTIN-EXP-R1-FX	137779	23.167	149717	29.367	157917*	33.233
05	AFTIN-EXP-R1MS-FB	133030	23.167	131807	29.367	127763	33.250
06	AFTIN-EXP-R1MS-FX	126558	23.150	127454	29.333	132752	33.217
07	SBLKSXLE0236-MB1	102014	23.150	110707	29.400	112424	33.267
08	SBLKSXLE0236-MB1 BS	104483	23.167	110278	29.383	112934	33.267
09	SBLKSXLE0236-MB1 BSD	113166	23.150	126026	29.417	123967	33.300

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

Data File: /chem/msbna/4500V.i/V021796.b/V021705.d
Report Date: 18-Feb-1996 12:16

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (UG/ML)	CONCENTRATIONS FINAL (UG/KG)
79 Chrysene	228.00	Compound Not Detected.					
80 Di-n-Octylphthalate	149.00	Compound Not Detected.					
81 Benzo(b)fluoranthene	252.00	Compound Not Detected.					
82 Benzo(k)fluoranthene	252.00	Compound Not Detected.					
83 Benzo(a)pyrene	252.00	Compound Not Detected.					
84 Indeno(1,2,3-cd)pyrene	276.00	Compound Not Detected.					
85 Dibenz(a,h)anthracene	278.00	Compound Not Detected.					
86 Benzo(g,h,i)perylene	276.00	Compound Not Detected.					

DAf 2/19/96

ADDITIONAL DOCUMENTATION

Roy eston, Inc. Lionville, Lab.

444 A

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/09/96 Extraction Batch No: 96LE0209 Analyst: DW Method: SEPF

Test: 0625 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/15/96 Solvent: DCM Adsorbent:

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
004 H	AFTOUT-EXP/SV-R1-CND			2.5		2.0		1.25	N		2.5
006 H	IN/OUT-EXP/SV-SB-ACE			2.5		2.0		1.25	N		2.5
009 H	IN/OUT-EXP/SV-SB-CND			2.5		2.0		1.25	N		2.5
020 H	AFTOUT-EXP/SV-R1-FB			2.5		2.0		1.25	N		2.5
021 H	AFTOUT-EXP/SV-R1-FX			25.0		2.0		12.5	N		25.0
022 H	IN/OUT-EXP/SV-SB-FX			25.0		2.0		12.5	N		25.0
9602L963-	COE-HOT GAS										
004 H	AFTOUT-EXPLSV-R2COMP			2.5		2.0		1.25	N		2.5
009 H	AFTOUT-EXPLSV-R3COND			2.5		2.0		1.25	N		2.5
014 H	AFTOUT-EXPLSV-BTCOND			2.5		2.0		1.25	N		2.5
026 H	AFTOUT-EXPLSV-R2-FB			2.5		2.0		1.25	N		2.5
027 H	AFTOUT-EXPLSV-R2-FX			25.0		2.0		12.5	N		25.0
028 H	AFTOUT-EXPLSV-R3-FB			2.5		2.0		1.25	N		2.5
029 H	AFTOUT-EXPLSV-R3-FX			25.0		2.0		12.5	N		25.0
030 H	AFTOUT-EXPLSV-BT-FB			2.5		2.0		1.25	N		2.5
031 H	AFTOUT-EXPLSV-BT-FX			25.0		2.0		12.5	N		25.0
96LE0209-MB1 H	SBLKSO			2.5		2.0		1.25	N		2.5
96LE0209-MB1 HS	SBLKSO			2.5	2.5	2.0		1.25	N		2.5
96LE0209-MB1 HT	SBLKSO			2.5	2.5	2.0		1.25	N		2.5

Comments:

Surrogate: 500 UL ESU 71A @ 100/200 UG/ML

Spike: 500 UL EMS 28 @ 100/200 UG/ML

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
			C. Taylor	1709 2/15/96	"Precision"

surrogate, multiplier & GPC for blanks

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

445

Extract. Date: 02/09/96 Extraction Batch No: 96LE0209 Analyst: DW Method: SEPF

Test: 0625 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/14/96 Solvent: DCM Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
004 H	AFTOUT-EXP/SV-R1-CND			2.5		2.0		1.25	Y	0.00	2.5
006 H	IN/OUT-EXP/SV-SB-ACE			2.5		2.0		1.25	Y	0.00	2.5
009 H	IN/OUT-EXP/SV-SB-CND			2.5		2.0		1.25	Y	0.00	2.5
020 H	AFTOUT-EXP/SV-R1-FB			2.5		2.0		1.25	Y	0.00	2.5
021 H	AFTOUT-EXP/SV-R1-FX			2.5		2.0		12.5	Y	0.00	25.0
022 H	IN/OUT-EXP/SV-SB-FX			2.5		2.0		12.5	Y	0.00	25.0
9602L963-	COE-HOT GAS										
004 H	AFTOUT-EXPLSV-R2COMP			2.5		2.0		1.25	Y	0.00	2.5
009 H	AFTOUT-EXPLSV-R3COND			2.5		2.0		1.25	Y	0.00	2.5
014 H	AFTOUT-EXPLSV-BTCOND			2.5		2.0		1.25	Y	0.00	2.5
026 H	AFTOUT-EXPLSV-R2-FB			2.5		2.0		1.25	Y	0.00	2.5
027 H	AFTOUT-EXPLSV-R2-FX			2.5		2.0		12.5	Y	0.00	25.0
028 H	AFTOUT-EXPLSV-R3-FB			2.5		2.0		1.25	Y	0.00	2.5
029 H	AFTOUT-EXPLSV-R3-FX			2.5		2.0		12.5	Y	0.00	25.0
030 H	AFTOUT-EXPLSV-BT-FB			2.5		2.0		1.25	Y	0.00	2.5
031 H	AFTOUT-EXPLSV-BT-FX			2.5		2.0		12.5	Y	0.00	25.0
96LE0209-MB1 H	SBLKSO			2.5		2.0		1.25	N	0.00	2.5
96LE0209-MB1 HS	SBLKSO			2.5	2.5	2.0		1.25	N	0.00	2.5
96LE0209-MB1 HT	SBLKSO			2.5	2.5	2.0		1.25	N	0.00	2.5

Comments:

Surrogate: 500 UL ESU 71A @ 100/200 UG/ML

Spike: 500 UL EMS 28 @ 100/200 UG/ML

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
all	Dnu Osey. u.	2/14/96 16:05	D Seich	2/15/96 0[illegible]	analyses

446-447
~~252~~

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96 Extraction Batch No: 96LLC017 Analyst: GL Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/09/96 Solvent: DCM/ACETONE TO ACN Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
006 0	IN/OUT-EXP/SV-SB-ACE	7	1	1.0		10		2.0	N	0.0	20.0
020 0	AFTOUT-EXP/SV-R1-FB	7	1	1.0		10		2.0	N	0.0	20.0
023 0	AFTIN-EXP-R1-FB	7	1	1.0		10		2.0	N		20.0
025 0	AFTIN-EXP-R1MS-FB	7	1	1.0		10		2.0	N		20.0
9602L963-	COE-HOT GAS										
026 0	AFTOUT-EXPLSV-R2-FB	7	1	1.0		10		2.0	N		20.0
028 0	AFTOUT-EXPLSV-R3-FB	7	1	1.0		10		2.0	N		20.0
030 0	AFTOUT-EXPLSV-BT-FB	7	1	1.0		10		2.0	N		20.0
032 0	AFTIN-EXP-R2-FB	7	1	1.0		10		2.0	N	0.0	20.0
034 0	AFTIN-EXP-R3-FB	7	1	1.0		10		2.0	N	0.0	20.0
96LLC017-MB1 0	BLK	7	1	1.0		10		2.0	N		20.0
96LLC017-MB1 0S	BLK	7	1	1.0	1.0	10		2.0	N		20.0

Comments: ALL REQUIRED FILTRATION THROGH SODIUM SULFATE
Surrogate: 50UL 41024101 1,2-DNB
Spike: 125UL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
N/A					

GL 2/9/96

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 46LLC013 SDG File Y/N: N/A

Analyst: F Klinger Test: 8330 Method: RSOE Solvent: ACN AAPrep: |

	RFW # (mL) Vol I	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank (770)	w		1 770	1.0		10	2	N
2	Blank Spike (770)	|		1	|	1.0	|	|	|
3	96021916-004 (580)	|		1	|		|	|	|
4	-009 (330)	|		1	|		|	|	|
5	-013* (400)	|		1	|		|	|	|
6	-018 (310)	|		1	|		|	|	|
7									
8									
9									
10									
11									
12									
13									
14				2/8/96					
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: N/A

End time: |

BN Fraction (Date/Time/Initials)

Start time: N/A

End time: |

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown: |

Blowdown: |

GPC Ready: |

GPC Cleanup: |

GPC #: |

After GPC Boildown: |

After GPC Blowdown: |

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: F Klinger 2/8/96

GPC Lab ID #: N/A

Florisil Lot #: |

Florisil Lab ID #: |

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to Volume (770mls) w/ DI H2O

* Bright yellow Extract => potentially high tgt Cmpds

Surrogate: 50ul 41C24C07 Spike: 125ul 461129B Witness:

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: F Klinger 2/8/96

Page # 57 448

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 76LLC014 SDG File Y/N: ______

Analyst: [illegible] Test: 3330 Method: Sono Solvent: ACN AAPrep: ______

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L916-021	Air			10		100	2	N
2	022								
3	024								
4	026								
5	Blank								
6	BS					10			
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

CB 2/8/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time: ______

End time: ______

BN Fraction (Date/Time/Initials)

Start time: ______

End time: ______

Extraction Information (Date/Analyst)

Filtration: ______

Boildown: ______

Blowdown: ______

GPC Ready: ______

GPC Cleanup: ______

GPC #: ______

After GPC Boildown: ______

After GPC Blowdown: ______

Acid/Florisil/Alumina Cleanup: ______

Prep Sheet: CB 2/8/96

GPC Lab ID #: ______

Florisil Lot #: ______

Florisil Lab ID #: ______

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Composite PAD + filter to the above numbered RFW. See COC for original sample ID. CB 2/7/96

ON: 1550 2/7/96

OFF: 0950 2/8/96 CB

Surrogate: 40uL 4102071C 1,2DNB @ 1000 ug/mL Spike: 1.25mL 4611298 Witness: ______

This Page Reviewed By/Date: [illegible] 2/9/96 Reviewed Against LIMS By/DATE: [illegible] 2/13/96

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

SDG File Y/N: N/A

Extract Date: 2/8/96 Extraction Batch #: 96 [illegible] 015 AAPrep: |

Analyst: F [illegible] Test: 8330 Method: 8330 Solvent: ACN

	RFW #	Vol (mL)	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank	(770)	w		1 (770)	1		10	2	N
2	Blank Spike	(770)					1			
3	96021963 - 004	(550)								
4	-009	(539)								
5	- 014**	(200)								
6	- 019*	(310)								
7	- 024*	(310)								
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

[illegible] 2/8/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time: N/A

End time:

BN Fraction (Date/Time/Initials)

Start time: N/A

End time:

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: [illegible] 2/8/96

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to Volume (770 mls) w/ DI H_2O

* Bright Yellow Extracts ~~[illegible]~~ likely high target Compounds

xx Sample 014 produced 20 mls [illegible] after 1st spin [illegible] additional (~50 mls) Salt water

Only added 2 mls ACN on 2nd spin. 22 ml FV [illegible] for Concentr [illegible].

Surrogate: 50 uL 41[illegible]4009 Spike: 125 uL 461129 B Witness:

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: [illegible] 2/8/96

Page # 450

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LC016 SDG File Y/N:

Analyst: Schnell Test: 8330 Method: Sonic Solvent: ACN AAPrep:

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L963-027	Air			10		100	2	N
2	029								
3	031								
4	033								
5	035								
6	Blank								
7	BS					10			
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21			2/8/96						
22									
23									
24									

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration:

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: 2/8/96

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: XAD + Filter Composites

ON 1430 2/8/96

OFF 0830 2/9/96

Surrogate: 40uL 4102471Ø 120NB@1000%L Spike: 1.25mL 461129B Witness:

This Page Reviewed By/Date: 2/8/96 Reviewed Against LIMS By/DATE: 2/8/96

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RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LLC017 SDG File Y/N:

Analyst: G. Weinweber Test: 08330 Method: KD Solvent: ACN AAPrep: 2/8/96

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-006	Sdo		370	1		10	2	N
2	-020			210					
3	-023			240					
4	-025			220					
5	96021963-026			240					
6	-028			210					
7	-030			180					
8	-032			235					
9	-034			325					
10	Blank			200					
11	Blank spike			200		1			
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

G. Lewin 2/9/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration:

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: 2/9/96 GW

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: DCM/ACETONE 50:50 used for B + BS
All initial volumes to be logged in as 1 for total ug.
Water in All samples requiring Sodium Sulfate filtering

Surrogate: 50ul 41024110 1,2DNB Spike: 461129B 125 ulE Witness:

This Page Reviewed By/Date: [signature] 2/12/96 Reviewed Against LIMS By/DATE: [signature] 2/14/96

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RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5158

Extract Date: 2/9/96 Extraction Batch #: 96LE0209 SDG File (Y)/N: Amo 2/12/96

Analyst: QW Test: 0625H Method: Sepf. Solvent: DCM AAPrep: D.O 2/9/

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-004	W	~~7.0~~ N/A	N/A	2.5		2.0	1.25	N
2	-006								
3	-009								
4	-020								
5	-021				25			12.5	
6	-022								
7	96022963-004				2.5			1.25	
8	-009								
9	-014								
10	-026								
11	-027				25			12.5	
12	-028				2.5			1.25	
13	-029				25			12.5	
14	-030				2.5			1.25	
15	-031			2/14/96	25			12.5	
16	Blank		~~7.0~~	~~1000~~	2.5			1.25	
17	BS					2.5			
18	BSD								
19									
20									
21									
22									
23									
24									

QW 2/9/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration: 2/9/96 QW

Boildown:

Blowdown: 2/10/96 AMO

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: AMO 2/10/

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table (1)/ 2 / 3 (circle one)

COMMENTS: 4mL of extract was delivered into 200 mL of DI H_2O in sepfunnel. Revision of the prepsheet, reflecting 4mL aliquots taken from 10mL and 100mL F.V.s of explosive extracts, was performed on 2/14/96 by D.O. per. J.D. instruction D.O 2/14/96.

Surrogate: 500uL 2/88 ESU-71A 33X7501 @100-200 ug/mL Spike: 500uL 7/88 EMS-23 33117302 @100-200 ug/mL Witness:

This Page Reviewed By/Date: AMO 2/16/96 Reviewed Against LIMS By/DATE: AMO 2/16/96

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5158

Extract Date: 2/14/96 Extraction Batch #: 96LE0236 SDG File Y/N: AMM 2/14

Analyst: MY Test: 0625H Method: SEPT Solvent: DCM AAPrep: AMM 2/15/9

	RFW #	Mtrx air	pH	Initial Wt/Vol (g/mL)	Surr Mult * D.O. 2/14/96	Spike Mult	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L916-013	W	N/A	N/A	~~1.0~~ 2.5		2.0	1.25	N
2	018				2.5			1.25	
3	024				25			12.5	
4	026				25			12.5	
5	023				2.5			1.25	
6	025				2.5			1.25	
7	963-019							1.25	
8	-024							1.25	
9	-032							1.25	
10	-033				25			12.5	
11	-034				2.5			1.25	
12	-035				25			12.5	
13	Blank				2.5			1.25	
14	B3					~~1~~ .025		1.25	
15	BSD					~~1.0~~ .025	D.O. 2/14/96	1.25	
16		D.O. 2/14/96			*	*			
17									
18									
19									
20									
21									
22									
23									
24									

AMM 2/15/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information

(Date/Analyst)

Filtration: 2/14/96 MY

Boildown: 2/14/96 DW

Blowdown: 2/15/96 D.O.

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: D.O. 2/15/96

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: PH & Initial Wt Volume was not applicable according to Schedule. MY 2/14/96 Samples are air - ~~therefore~~ pH and init. vol. - not needed. D.O 2/14/96.
* Sur. and spike multiplier changed to accom. GC/MS SVOA calculations per S.Du 3311750l

Surrogate: 500 µL ESU71A @ 100/200 V's/mL Spike: 500 µL EMS28 3311730 2@ Witness: BO

This Page Reviewed By/Date: D.O. 2/15/96 Reviewed Against LIMS By/DATE: AMM 2/16/96

RFW 21-21-019/Z-11/93

END OF DATA PACKAGE

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~~447~~

Roy F. Weston, Inc. - Lionville Laboratory
BNA ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96 RFW LOT # :9602L963

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-EXPLSV-R2COMP	004	AI	96LE0209	02/02/96	02/09/96	02/11/96
AFTOUT-EXPLSV-R3COND	009	AI	96LE0209	02/04/96	02/09/96	02/11/96
AFTOUT-EXPLSV-BTCOND	014	AI	96LE0209	02/04/96	02/09/96	02/11/96
AFTIN-EXP-R2-COND	019	AI	96LE0236	02/02/96	02/14/96	02/20/96
AFTIN-EXP-R3-COND	024	AI	96LE0236	02/04/96	02/14/96	02/20/96
AFTOUT-EXPLSV-R2-FB	026	AI	96LE0209	02/02/96	02/09/96	02/13/96
AFTOUT-EXPLSV-R2-FX	027	AI	96LE0209	02/02/96	02/09/96	02/13/96
AFTOUT-EXPLSV-R3-FB	028	AI	96LE0209	02/04/96	02/09/96	02/13/96
AFTOUT-EXPLSV-R3-FX	029	AI	96LE0209	02/04/96	02/09/96	02/13/96
AFTOUT-EXPLSV-BT-FB	030	AI	96LE0209	02/04/96	02/09/96	02/13/96
AFTOUT-EXPLSV-BT-FX	031	AI	96LE0209	02/04/96	02/09/96	02/13/96
AFTIN-EXP-R2-FB	032	AI	96LE0236	02/02/96	02/14/96	02/17/96
AFTIN-EXP-R2-FX	033	AI	96LE0236	02/02/96	02/14/96	02/19/96
AFTIN-EXP-R3-FB	034	AI	96LE0236	02/04/96	02/14/96	02/19/96
AFTIN-EXP-R3-FX	035	AI	96LE0236	02/04/96	02/14/96	02/19/96

LAB QC:

SBLKSO	MB1	AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSO	MB1 BS	AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSO	MB1 BSD	AI	96LE0209	N/A	02/09/96	02/11/96
SBLKSX	MB1	AI	96LE0236	N/A	02/14/96	02/17/96
SBLKSX	MB1 BS	AI	96LE0236	N/A	02/14/96	02/17/96
SBLKSX	MB1 BSD	AI	96LE0236	N/A	02/14/96	02/17/96

001

TABLE OF CONTENTS

CHAIN OF CUSTODY

9602L963 Explosives AFT OUTLET

WESTON Analytics Use Only

~~9602L962~~ 2/7/96

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 2

005

Client: COE-HOT GAS

Est. Final Proj. Sampling Date

Work Order #: 02281-012-012-1200

Project Contact/Phone #: J. O'Neill X7201

AD Project Manager: K. Baker

QC: SDD

Date Rec'd: 2/7/96

Date Due: 2/14/96

Account #: COEHOTGAS

Refrigerator #	
#/Type Container	Liquid / Solid
Volume	Liquid / Solid
Preservatives	
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only: Explosives EPA 8330*; 6020 6010; Semivolatiles EPA 8270**

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330*	6020 6010	Semivolatiles EPA 8270**
1	COE-HG-AFTOUT-EXP/V-K2-EHS				2/2/96		X		X
2	COE-HG-AFTOUT-EXP/V-K2-FLT						X		X
3	COE-HG-AFTOUT-EXP/V-K2-XAD						X		X
4	COE-HG-AFTOUT-EXP/V-K2-COMP						X 9/27/96	✓	X
5	COE-HG-AFTOUT-EXP/V-K2-BHS						X		X
6	COE-HG-AFTOUT-EXP/V-K3-FHS				2/4/96		X		X
7	COE-HG-AFTOUT-EXP/V-K3-FLT						X		X
8	COE-HG-AFTOUT-EXP/V-K3-XAD						X		X
9	COE-HG-AFTOUT-EXP/V-K3-COMP						X 9/27/96	✓	X
10	COE-HG-AFTOUT-EXP/V-K3-BHS						X		X

Run 2

Run 3

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

* RDX; HMX; tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT

DATE/REVISIONS:

1. ** Analyze one of 3
2. tests for lower
3. carbon number semi-volatile
4. by EPA 8015.
5. Select highest explosive
6. extract and analyze

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S. DCarl	Richards	2/7/96	15:40				

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped X or Hand Delivered
Airbill #
2) (Ambient) or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

See pg 2 for revisions

Explosives - AFT outlet

WESTON Analytics Use Only: 9602L963

Custody Transfer Record/Lab Work Request

WESTON

2084

006

Client: COE - HOT GAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: J. O'Neill x7201
AD Project Manager: K. Baker
QC: SDD Del: SDD TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED →
ORGANIC: VOA, BNA, Pest/PCB, Herb
INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Explosives EPA 8330* 8330X	Semivolatiles EPA 8270	EPA 8015
011	COE-HG-AFTOUT-EXP/SV-BT-FHS			Air	2/4/96		X	X	X
12	COE-HG-AFTOUT-EXP/SV-BT-FLT						X	X	X
13	COE-HG-AFTOUT-EXP/SV-BT-XAD			Air			X	X	X
14	COE-HG-AFTOUT-EXP/SV-BT-CONDENS			Air			X 2/7/96	X	X 2/7
15	COE-HG-AFTOUT-EXP/SV-BT-BHS			Air			X	X	X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

* RDX; HMX; tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB; 2,4,6-TNT

DATE/REVISIONS:
1. Analyze BT for
2. 8015 Semi Volatiles
3. 8015 to be logged as a
4. later date
5. 2/10/96 Cancelled 8015 on #19,024
6. per SDR # 96PM0089

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
S.D. Neal	J. Burkhardt	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N

RFW 21-21-001/A-7/91 L373 L375 L377 L378 Ref# ___ Cooler# ___ 381-596a

~~2/14/96 All~~ matrix's on all samples are Air ~~per SDR~~ DGP 2/14/96

9602L963

Explosives . K AFT INLET

WESTON Analytics Use Only
9602L963 [illegible] 2/7/96

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client COE-HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-092-012-1200
Project Contact/Phone # J. ONeill X7201
AD Project Manager K. Baker
QC STD Del STD TAT
Date Rec'd ______ Date Due ______
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; Comp; INORG: Metal, CN

WESTON Analytics Use Only: Explosives EPA 8330*; Semi Vol. 8015**

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Explosives EPA 8330*						Semi Vol. 8015**	
016	COE-HG-AFTIN-EXP-R2-FHS				2/2/96						X						X	RUN 2
17	COE-HG-AFTIN-EXP-R2-FILT										X						X	
18	COE-HG-AFTIN-EXP-R2-XAD										X						X	
19	COE-HG-AFTIN-EXP-R2-CONDIN						✓	✓			X						X	
20	COE-HG-AFTIN-EXP-R2-BHS										X						X	
21	COE-HG-AFTIN-EXP-R3-FHS				2/4/96						X						X	Run 3
22	COE-HG-AFTIN-EXP-R3-FILT										X						X	
23	COE-HG-AFTIN-EXP-R3-XAD										X						X	
24	COE-HG-AFTIN-EXP-R3-CONDIN						✓	✓			X						X	
25	COE-HG-AFTIN-EXP-R3-BHS										X						X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
* RDX; HMX; tetryl; 2,4-DNT; 2,6-DNT; NB; 1,3-DNB; 1,3,5-TNB 2,4,6-TNT

DATE/REVISIONS:
1. ** Analyze 1 of 3
2. 1st runs for
3. lower carbon number
4. semi volatiles only
5. EPA 8015 - select run
6. based on highest 8330 value

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Todd	Richardson	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped __ or Hand Delivered __
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# ______ Cooler# ______ 381-596a

Custody Transfer Record/Lab Work Request

WESTON Analytics Use Only: 9602L968

WESTON — Page 4 of 4

~~009~~ 800

Client: COE-HotGAS
Est. Final Proj. Sampling Date:
Work Order #:
Project Contact/Phone #:
AD Project Manager:
QC: | TAT:
Date Rec'd: | Date Due:
Account #:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA (0625A)	Pest/PCB	Herb	(0533)	Metal	CN	WESTON Analytics Use Only (Comp of)
26	AFTOUT-EXP/SV-R2-FB			Air	2/2/96			✓			✓			001+005
27	AFTOUT-EXP/SV-R2-FX													002+003
28	AFTOUT-EXP/SV-R3-FB				2/4/96									006+010
29	AFTOUT-EXP/SV-R3-FX													007+008
30	AFTOUT-EXP/SV-~~R3-FB~~ BT-FB				2/4/96									011+015
31	AFTOUT-EXP/SV-~~R3-FX~~ BT-FX													012+013
32	AFTIN-EXP-R2-FB				2/2/96			✓			✓			016+020
33	AFTIN-EXP-R2-FX							✓						017+018
34	AFTIN-EXP-R3-FB				2/4/96			✓						021+025
35	AFTIN-EXP-R3-FX							✓						022+023

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

FB = FHS+BHS Composite
FX = FILT+XAD COMP

DATE/REVISIONS:
2/12/96 1. 625 added to 019, 024, 032, 033, 034 + 035
2. on 9602L0092
2/14/96 3. All Matrix = Air per 95PM0098
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Field	[illegible]	2/7/96	1540				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381 596a

WESTON® Sample Discrepancy Report (SDR) SDR #: 96MS080

Initiator: Deb Feick RFW Batch: 9602L916, 963 Parameter: 0625H
Date: 2/14/96 Samples: see below Matrix: Air water
Client: CDE- Hot Gas Method: SW846/MCAWW/CLP/ Prep Batch: 95LE0809

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
__ Transcription Error __ Wrong Test Code __ Other ______

b. General Discrepancy
__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-in] or [Prep Group] (circle)...signature/date: ______

c. QC Problem (Include all relevant specific results; attach data if necessary)
FYI - due to initial extraction for HPLC with ~~Acetone~~ acetonitrile, the following samples had poor chromatography: 9602L916-004, 009, 021, 022; 9602L963-004, 009, 014, 027, 029, 031. Each internal + surrogate in these samples was split into 2 or 3 peaks. See attached.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:
__ Re-log
__ Entire Batch
__ Following Samples: ______
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ______
__ Place On/Take Off Hold (circle)

① Sum split peaks and report total % recovery.
② Bring up remaining extract in a volume of DCM and re-concentrate + reanalyze.

4. Project Manager Instructions...signature/date: [signature] 2/14/96
X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction → Concur with ①.
__ Include in Case Narrative
__ Client Contacted:
Date/Person: ______
__ Add
__ Cancel

② Attempt to exchange samples 916-004, 021 (and 020 if necessary) to DCM only and reanalyze. Please have Kevin Meenan talk to OSPU on the procedure. [initials] 2/14

5. Final Action...signature/date: ______ Other Explanation:
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

Reported the "exchanged" extracts for samples 9602L916-004 and 9602L916-021 as reanalyses for confirmation. Noted in narrative [initials] 3/20/96

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator Deb Feick	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
1	X Project Mgr: Kelly Baker	__	__ GC/LC: Jarvis/Skrzat/Schnell
2,3	X Section Mgr: Siery/Durke/Daniels	__	✓ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	✓ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ______

RFW 21-21-006/E-03/95

WESTON Sample Discrepancy Report (SDR) SDR #: [illegible]

Initiator: K. Baker RFW Batch: 9602L963,916 Parameter: SVOA
Date: 2-9-96 Samples: see below Matrix: Air
Client: COE-HOT GAS Method: SW846 MCAWW CLP Prep Batch: ______

1. **Reason for SDR**
   a. **COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C
   __ Transcription Error __ Wrong Test Code __ Other ______

   b. **General Discrepancy***
   __ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
   __ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
   __ Improper Bottle Type __ Not Amenable to Analysis

   Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

   c. **QC Problem** (Include all relevant specific results; attach data if necessary)
   Add 0625 to the following samples.
   9602L916-13, 18, 23, 24, 25, 26
   9602L963-19, 24, 32, 33, 34, 35

2. **Known or Probable Causes(s)**

3. **Discussion and Proposed Action** Other Description:
   X Re-log
   __ Entire Batch
   X Following Samples: See above
   __ Re-leach
   __ Re-extract
   __ Re-digest
   __ Revise EDD
   __ Change Test Code to ______
   __ Place On/Take Off Hold (circle)

4. **Project Manager Instructions**...signature/date: K Baker 2/9/96
   X Concur with Proposed Action
   __ Disagree with Proposed Action; See Instruction
   __ Include in Case Narrative
   X Client Contacted;
   Date/Person Colleen Parker 2/9/96
   __ Add
   __ Cancel

5. **Final Action**...signature/date: 092 12 96 Other Explanation:
   __ Verified re-[log][leach][extract][digest][analysis] (circle)
   __ Included in Case Narrative
   ✓ Hard Copy COC Revised
   ✓ Electronic COC Revised
   __ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr: ______	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ______

RFW 21-21-006/E-03/95

WESTON Sample Discrepancy Report (SDR)

SDR #: [illegible]

Initiator: K.Baker
Date: 2-14-96
Client: AAAP HotGas

RFW Batch: 9602L916, 943
Samples: All
Method: SW846/MCAWW/CLP

Parameter: All
Matrix: Air
Prep Batch: ______

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Transcription Error __ Client Request __ Wrong Test Code __ Sampler Error on C-O-C. X Other Wrong matrix

b. General Discrepancy
__ Missing Sample/Extract* __ Hold Time Exceeded __ Improper Bottle Type __ Container Broken __ Insufficient Sample* __ Not Amenable to Analysis __ Wrong Sample Pulled __ Preservation Wrong __ Label ID's Illegible __ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: ______

c. QC Problem (Include all relevant specific results; attach data if necessary)

ALL matrices should be air.
please change all samples listed as water to air.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action

__ Re-log
__ Entire Batch
__ Following Samples: ______
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to ______
__ Place On/Take Off Hold (circle)

Other Description:

X change matrix where appropriate to air.

4. Project Manager Instructions...signature/date: K Baker 2/14/96

X Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person ______
__ Add
__ Cancel

5. Final Action...signature/date: [illegible] 2/15/96

Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
__	X Project Mgr: ______	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/Durke/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other: ______

RFW 21-21-006/E-03/95

DATA SUMMARY

010

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List

Report Date: 02/20/96 15:31

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 1a

	Cust ID:	AFTOUT-EXPLS V-R2COMP		AFTOUT-EXPLS V-R3COND		AFTOUT-EXPLS V-BTCOND		AFTIN-EXP-R2 -COND		AFTIN-EXP-R3 -COND		AFTOUT-EXPLS V-R2-FB	
Sample	RFW#:	004		009		014		019		024		026	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	2.50		2.50		2.50		12.5		12.5		2.50	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
	Nitrobenzene-d5	67	%	65	%	61	%	61	%	63	%	74	%
Surrogate	2-Fluorobiphenyl	68	%	62	%	72	%	55	%	51	%	66	%
Recovery	p-Terphenyl-d14	83	%	91	%	81	%	83	%	67	%	94	%
	Phenol-d5	55	%	50	%	52	%	53	%	49	%	68	%
	2-Fluorophenol	80	%	69	%	72	%	104	%	106	%	82	%
	2,4,6-Tribromophenol	84	%	82	%	75	%	48	%	49	%	71	%
			fl		fl		fl		fl		fl		fl
Phenol		25	U	25	U	25	U	120	U	120	U	25	U
bis(2-Chloroethyl)ether		25	U	25	U	25	U	120	U	120	U	25	U
2-Chlorophenol		25	U	25	U	25	U	120	U	120	U	25	U
1,3-Dichlorobenzene		25	U	25	U	25	U	120	U	120	U	25	U
1,4-Dichlorobenzene		25	U	25	U	25	U	120	U	120	U	25	U
Benzyl alcohol		25	U	25	U	25	U	120	U	120	U	25	U
1,2-Dichlorobenzene		25	U	25	U	25	U	120	U	120	U	25	U
2-Methylphenol		25	U	25	U	25	U	120	U	120	U	25	U
bis(2-Chloroisopropyl)ether		25	U	25	U	25	U	120	U	120	U	25	U
4-Methylphenol		25	U	25	U	25	U	120	U	120	U	25	U
N-Nitroso-Di-n-propylamine		25	U	25	U	25	U	120	U	120	U	25	U
Hexachloroethane		25	U	25	U	25	U	120	U	120	U	25	U
Nitrobenzene		25	U	25	U	25	U	120	U	120	U	25	U
Isophorone		25	U	25	U	25	U	120	U	120	U	25	U
2-Nitrophenol		25	U	25	U	25	U	120	U	120	U	25	U
2,4-Dimethylphenol		25	U	25	U	25	U	120	U	120	U	25	U
Benzoic acid		120	U	120	U	120	U	620	U	620	U	120	U
bis(2-Chloroethoxy)methane		25	U	25	U	25	U	120	U	120	U	25	U
2,4-Dichlorophenol		25	U	25	U	25	U	120	U	120	U	25	U
1,2,4-Trichlorobenzene		25	U	25	U	25	U	120	U	120	U	25	U
Naphthalene		25	U	25	U	25	U	120	U	120	U	25	U
4-Chloroaniline		25	U	25	U	25	U	120	U	120	U	25	U
Hexachlorobutadiene		25	U	25	U	25	U	120	U	120	U	25	U
4-Chloro-3-methylphenol		25	U	25	U	25	U	120	U	120	U	25	U
2-Methylnaphthalene		25	U	25	U	25	U	120	U	120	U	25	U
Hexachlorocyclopentadiene		25	U	25	U	25	U	120	U	120	U	25	U

*= Outside of EPA CLP QC limits.

014

Cust ID:	AFTOUT-EXPLS V-R2COMP		AFTOUT-EXPLS V-R3COND		AFTOUT-EXPLS V-BTCOND		AFTIN-EXP-R2 -COND		AFTIN-EXP-R3 -COND		AFTOUT-EXPLS V-R2-FB	
RFW#:	004		009		014		019		024		026	
2,4,6-Trichlorophenol	25	U	25	U	25	U	120	U	120	U	25	U
2,4,5-Trichlorophenol	120	U	120	U	120	U	620	U	620	U	120	U
2-Chloronaphthalene	25	U	25	U	25	U	120	U	120	U	25	U
2-Nitroaniline	120	U	120	U	120	U	620	U	620	U	120	U
Dimethylphthalate	25	U	25	U	25	U	120	U	120	U	25	U
Acenaphthylene	25	U	25	U	25	U	120	U	120	U	25	U
2,6-Dinitrotoluene	25	U	25	U	25	U	120	U	120	U	25	U
3-Nitroaniline	120	U	120	U	120	U	620	U	620	U	120	U
Acenaphthene	25	U	25	U	25	U	120	U	120	U	25	U
2,4-Dinitrophenol	120	U	120	U	120	U	620	U	620	U	120	U
4-Nitrophenol	120	U	120	U	120	U	620	U	620	U	120	U
Dibenzofuran	25	U	25	U	25	U	120	U	120	U	25	U
2,4-Dinitrotoluene	25	U	25	U	25	U	120	U	120	U	25	U
Diethylphthalate	25	U	25	U	25	U	120	U	120	U	25	U
4-Chlorophenyl-phenylether	25	U	25	U	25	U	120	U	120	U	25	U
Fluorene	25	U	25	U	25	U	120	U	120	U	25	U
4-Nitroaniline	120	U	120	U	120	U	620	U	620	U	120	U
4,6-Dinitro-2-methylphenol	120	U	120	U	120	U	620	U	620	U	120	U
N-Nitrosodiphenylamine (1)	25	U	25	U	25	U	120	U	120	U	25	U
4-Bromophenyl-phenylether	25	U	25	U	25	U	120	U	120	U	25	U
Hexachlorobenzene	25	U	25	U	25	U	120	U	120	U	25	U
Pentachlorophenol	14	JB	120	U	120	U	620	U	620	U	120	U
Phenanthrene	25	U	25	U	25	U	120	U	120	U	25	U
Anthracene	25	U	25	U	25	U	120	U	120	U	25	U
Di-n-Butylphthalate	25	U	25	U	25	U	120	U	120	U	25	U
Fluoranthene	25	U	25	U	25	U	120	U	120	U	25	U
Pyrene	25	U	25	U	25	U	120	U	120	U	25	U
Butylbenzylphthalate	25	U	25	U	25	U	120	U	120	U	25	U
3,3'-Dichlorobenzidine	50	U	50	U	50	U	250	U	250	U	50	U
Benzo(a)anthracene	25	U	25	U	25	U	120	U	120	U	3	J
Chrysene	25	U	25	U	25	U	120	U	120	U	2	J
bis(2-Ethylhexyl)phthalate	25	U	3	JB	25	U	120	U	120	U	11	JB
Di-n-Octyl phthalate	25	U	25	U	25	U	120	U	120	U	2	J
Benzo(b)fluoranthene	25	U	25	U	25	U	120	U	120	U	25	U
Benzo(k)fluoranthene	25	U	25	U	25	U	120	U	120	U	25	U
Benzo(a)pyrene	25	U	25	U	25	U	120	U	120	U	25	U
Indeno(1,2,3-cd)pyrene	25	U	25	U	25	U	120	U	120	U	25	U
Dibenzo(a,h)anthracene	25	U	25	U	25	U	120	U	120	U	25	U
Benzo(g,h,i)perylene	25	U	25	U	25	U	120	U	120	U	25	U
Carbazole	25	U	25	U	25	U	120	U	120	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. ionville Laboratory
Semivolatiles by GC/MS, HSL List
Report Date: 02/20/96 15:31

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 2a

	Cust ID:	AFTOUT-EXPLS V-R2-FX		AFTOUT-EXPLS V-R3-FB		AFTOUT-EXPLS V-R3-FX		AFTOUT-EXPLS V-BT-FB		AFTOUT-EXPLS V-BT-FX		AFTIN-EXP-R2 -FB	
Sample	RFW#:	027		028		029		030		031		032	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	25.0		2.50		25.0		2.50		25.0		2.50	
	Units:	total ug		total ug		total ug		total ug		total ug		total ug	
	Nitrobenzene-d5	92	%	73	%	90	%	69	%	93	%	70	%
Surrogate	2-Fluorobiphenyl	76	%	63	%	74	%	64	%	68	%	79	%
Recovery	p-Terphenyl-d14	104	%	99	%	101	%	93	%	109	%	105	%
	Phenol-d5	75	%	65	%	77	%	61	%	73	%	68	%
	2-Fluorophenol	95	%	77	%	91	%	68	%	92	%	113	%
	2,4,6-Tribromophenol	73	%	72	%	75	%	62	%	72	%	76	%
			fl		fl		fl		fl		fl		fl
Phenol		250	U	25	U	250	U	25	U	250	U	25	U
bis(2-Chloroethyl)ether		250	U	25	U	250	U	25	U	250	U	25	U
2-Chlorophenol		250	U	25	U	250	U	25	U	250	U	25	U
1,3-Dichlorobenzene		250	U	25	U	250	U	25	U	250	U	25	U
1,4-Dichlorobenzene		250	U	25	U	250	U	25	U	250	U	25	U
Benzyl alcohol		250	U	25	U	250	U	25	U	250	U	25	U
1,2-Dichlorobenzene		250	U	25	U	250	U	25	U	250	U	25	U
2-Methylphenol		250	U	25	U	250	U	25	U	250	U	25	U
bis(2-Chloroisopropyl)ether		250	U	25	U	250	U	25	U	250	U	25	U
4-Methylphenol		250	U	25	U	250	U	25	U	250	U	25	U
N-Nitroso-Di-n-propylamine		250	U	25	U	250	U	25	U	250	U	25	U
Hexachloroethane		250	U	25	U	250	U	25	U	250	U	25	U
Nitrobenzene		250	U	25	U	250	U	25	U	250	U	25	U
Isophorone		250	U	25	U	250	U	25	U	250	U	25	U
2-Nitrophenol		250	U	25	U	250	U	25	U	250	U	25	U
2,4-Dimethylphenol		250	U	25	U	250	U	25	U	250	U	25	U
Benzoic acid		1200	U	120	U	1200	U	120	U	1200	U	120	U
bis(2-Chloroethoxy)methane		250	U	25	U	250	U	25	U	250	U	25	U
2,4-Dichlorophenol		250	U	25	U	250	U	25	U	250	U	25	U
1,2,4-Trichlorobenzene		250	U	25	U	250	U	25	U	250	U	25	U
Naphthalene		250	U	25	U	250	U	25	U	250	U	25	U
4-Chloroaniline		250	U	25	U	250	U	25	U	250	U	25	U
Hexachlorobutadiene		250	U	25	U	250	U	25	U	250	U	25	U
4-Chloro-3-methylphenol		250	U	25	U	250	U	25	U	250	U	25	U
2-Methylnaphthalene		250	U	25	U	250	U	25	U	250	U	25	U
Hexachlorocyclopentadiene		250	U	25	U	250	U	25	U	250	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L963   Client: COE-HOT GAS   Work Order: 02281012012   Page: 2b

Cust ID:	AFTOUT-EXPLS V-R2-FX		AFTOUT-EXPLS V-R3-FB		AFTOUT-EXPLS V-R3-FX		AFTOUT-EXPLS V-BT-FB		AFTOUT-EXPLS V-BT-FX		AFTIN-EXP-R2 -FB	
RFW#:	027		028		029		030		031		032	
2,4,6-Trichlorophenol	250	U	25	U	250	U	25	U	250	U	25	U
2,4,5-Trichlorophenol	1200	U	120	U	1200	U	120	U	1200	U	120	U
2-Chloronaphthalene	250	U	25	U	250	U	25	U	250	U	25	U
2-Nitroaniline	1200	U	120	U	1200	U	120	U	1200	U	120	U
Dimethylphthalate	250	U	25	U	250	U	25	U	250	U	25	U
Acenaphthylene	250	U	25	U	250	U	25	U	250	U	25	U
2,6-Dinitrotoluene	250	U	25	U	250	U	25	U	250	U	25	U
3-Nitroaniline	1200	U	120	U	1200	U	120	U	1200	U	120	U
Acenaphthene	250	U	25	U	250	U	25	U	250	U	25	U
2,4-Dinitrophenol	1200	U	120	U	1200	U	120	U	1200	U	120	U
4-Nitrophenol	1200	U	120	U	1200	U	120	U	1200	U	120	U
Dibenzofuran	250	U	25	U	250	U	25	U	250	U	25	U
2,4-Dinitrotoluene	250	U	25	U	250	U	25	U	250	U	25	U
Diethylphthalate	34	J	25	U	250	U	25	U	250	U	25	U
4-Chlorophenyl-phenylether	250	U	25	U	250	U	25	U	250	U	25	U
Fluorene	250	U	25	U	250	U	25	U	250	U	25	U
4-Nitroaniline	1200	U	120	U	1200	U	120	U	1200	U	120	U
4,6-Dinitro-2-methylphenol	1200	U	120	U	1200	U	120	U	1200	U	120	U
N-Nitrosodiphenylamine (1)	250	U	25	U	250	U	25	U	250	U	25	U
4-Bromophenyl-phenylether	250	U	25	U	250	U	25	U	250	U	25	U
Hexachlorobenzene	250	U	25	U	250	U	25	U	250	U	25	U
Pentachlorophenol	1200	U	120	U	1200	U	120	U	1200	U	120	U
Phenanthrene	250	U	25	U	250	U	25	U	250	U	25	U
Anthracene	250	U	25	U	250	U	25	U	250	U	25	U
Di-n-Butylphthalate	250	U	25	U	250	U	25	U	250	U	25	U
Fluoranthene	250	U	25	U	250	U	25	U	250	U	25	U
Pyrene	250	U	25	U	250	U	25	U	250	U	25	U
Butylbenzylphthalate	250	U	25	U	250	U	25	U	250	U	25	U
3,3'-Dichlorobenzidine	500	U	50	U	500	U	50	U	500	U	50	U
Benzo(a)anthracene	250	U	25	U	250	U	25	U	250	U	25	U
Chrysene	250	U	25	U	250	U	25	U	250	U	25	U
bis(2-Ethylhexyl)phthalate	250	U	8	JB	250	U	19	JB	220	JB	33	
Di-n-Octyl phthalate	250	U	25	U	250	U	25	U	250	U	25	U
Benzo(b)fluoranthene	250	U	25	U	250	U	25	U	250	U	25	U
Benzo(k)fluoranthene	250	U	25	U	250	U	25	U	250	U	25	U
Benzo(a)pyrene	250	U	25	U	250	U	25	U	250	U	25	U
Indeno(1,2,3-cd)pyrene	250	U	25	U	250	U	25	U	250	U	25	U
Dibenzo(a,h)anthracene	250	U	25	U	250	U	25	U	250	U	25	U
Benzo(g,h,i)perylene	250	U	25	U	250	U	25	U	250	U	25	U
Carbazole	250	U	25	U	250	U	25	U	250	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List
Report Date: 02/20/96 15:31
RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 3a

017

	Cust ID:	AFTIN-EXP-R2 -FX	AFTIN-EXP-R3 -FB	AFTIN-EXP-R3 -FX	SBLKSO	SBLKSO BS	SBLKSO BSD
Sample Information	RFW#:	033	034	035	96LE0209-MB1	96LE0209-MB1	96LE0209-MB1
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	25.0	2.50	25.0	2.50	2.50	2.50
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
Surrogate Recovery	Nitrobenzene-d5	31 %	54 %	56 %	74 %	72 %	66 %
	2-Fluorobiphenyl	33 %	66 %	68 %	75 %	82 %	77 %
	p-Terphenyl-d14	64 %	87 %	87 %	81 %	84 %	75 %
	Phenol-d5	30 %	52 %	57 %	19 * %	19 * %	17 * %
	2-Fluorophenol	45 %	73 %	80 %	46 %	36 %	31 %
	2,4,6-Tribromophenol	44 %	60 %	71 %	68 %	91 %	84 %
		fl	fl	fl	fl	fl	fl
Phenol		250 U	25 U	250 U	25 U	18 * %	17 * %
bis(2-Chloroethyl)ether		250 U	25 U	250 U	25 U	25 U	25 U
2-Chlorophenol		250 U	25 U	250 U	25 U	65 %	59 %
1,3-Dichlorobenzene		250 U	25 U	250 U	25 U	25 U	25 U
1,4-Dichlorobenzene		250 U	25 U	250 U	25 U	65 %	58 %
Benzyl alcohol		250 U	25 U	250 U	25 U	25 U	25 U
1,2-Dichlorobenzene		250 U	25 U	250 U	25 U	25 U	25 U
2-Methylphenol		250 U	25 U	250 U	25 U	25 U	25 U
bis(2-Chloroisopropyl)ether		250 U	25 U	250 U	25 U	25 U	25 U
4-Methylphenol		250 U	25 U	250 U	25 U	25 U	25 U
N-Nitroso-Di-n-propylamine		250 U	25 U	250 U	25 U	77 %	70 %
Hexachloroethane		250 U	25 U	250 U	25 U	25 U	25 U
Nitrobenzene		250 U	25 U	250 U	25 U	25 U	25 U
Isophorone		250 U	25 U	250 U	25 U	25 U	25 U
2-Nitrophenol		250 U	25 U	250 U	25 U	25 U	25 U
2,4-Dimethylphenol		250 U	25 U	250 U	25 U	25 U	25 U
Benzoic acid		1200 U	120 U	1200 U	120 U	120 U	120 U
bis(2-Chloroethoxy)methane		250 U	25 U	250 U	25 U	25 U	25 U
2,4-Dichlorophenol		250 U	25 U	250 U	25 U	25 U	25 U
1,2,4-Trichlorobenzene		250 U	25 U	250 U	25 U	73 %	67 %
Naphthalene		250 U	25 U	250 U	25 U	25 U	25 U
4-Chloroaniline		250 U	25 U	250 U	25 U	25 U	25 U
Hexachlorobutadiene		250 U	25 U	250 U	25 U	25 U	25 U
4-Chloro-3-methylphenol		250 U	25 U	250 U	25 U	75 %	68 %
2-Methylnaphthalene		250 U	25 U	250 U	25 U	25 U	25 U
Hexachlorocyclopentadiene		250 U	25 U	250 U	25 U	25 U	25 U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 3b

Cust ID:	AFTIN-EXP-R2 -FX		AFTIN-EXP-R3 -FB		AFTIN-EXP-R3 -FX		SBLKSO		SBLKSO BS		SBLKSO BSD	
RFW#:	033		034		035		96LE0209-MB1		96LE0209-MB1		96LE0209-MB1	
2,4,6-Trichlorophenol	250	U	25	U	250	U	25	U	25	U	25	U
2,4,5-Trichlorophenol	1200	U	120	U	1200	U	120	U	120	U	120	U
2-Chloronaphthalene	250	U	25	U	250	U	25	U	25	U	25	U
2-Nitroaniline	1200	U	120	U	1200	U	120	U	120	U	120	U
Dimethylphthalate	250	U	25	U	250	U	25	U	25	U	25	U
Acenaphthylene	250	U	25	U	250	U	25	U	25	U	25	U
2,6-Dinitrotoluene	250	U	25	U	250	U	25	U	25	U	25	U
3-Nitroaniline	1200	U	120	U	1200	U	120	U	120	U	120	U
Acenaphthene	250	U	25	U	250	U	25	U	74	*	69	*
2,4-Dinitrophenol	1200	U	120	U	1200	U	120	U	120	U	120	U
4-Nitrophenol	1200	U	120	U	1200	U	120	U	19	*	19	*
Dibenzofuran	250	U	25	U	250	U	25	U	25	U	25	U
2,4-Dinitrotoluene	250	U	25	U	250	U	25	U	82	*	76	*
Diethylphthalate	250	U	25	U	250	U	25	U	25	U	25	U
4-Chlorophenyl-phenylether	250	U	25	U	250	U	25	U	25	U	25	U
Fluorene	250	U	25	U	250	U	25	U	25	U	25	U
4-Nitroaniline	1200	U	120	U	1200	U	120	U	120	U	120	U
4,6-Dinitro-2-methylphenol	1200	U	120	U	1200	U	120	U	120	U	120	U
N-Nitrosodiphenylamine (1)	250	U	25	U	250	U	25	U	25	U	25	U
4-Bromophenyl-phenylether	250	U	25	U	250	U	25	U	25	U	25	U
Hexachlorobenzene	250	U	25	U	250	U	25	U	25	U	25	U
Pentachlorophenol	1200	U	120	U	1200	U	3	J	78	*	82	*
Phenanthrene	250	U	25	U	250	U	25	U	25	U	25	U
Anthracene	250	U	25	U	250	U	25	U	25	U	25	U
Di-n-Butylphthalate	250	U	25	U	250	U	25	U	25	U	25	U
Fluoranthene	250	U	25	U	250	U	25	U	25	U	25	U
Pyrene	250	U	25	U	250	U	25	U	77	*	68	*
Butylbenzylphthalate	250	U	25	U	250	U	25	U	25	U	25	U
3,3'-Dichlorobenzidine	500	U	50	U	500	U	50	U	50	U	50	U
Benzo(a)anthracene	250	U	25	U	250	U	25	U	25	U	25	U
Chrysene	250	U	25	U	250	U	25	U	25	U	25	U
bis(2-Ethylhexyl)phthalate	250	U	10	J	150	J	7	J	13	JB	25	U
Di-n-Octyl phthalate	250	U	25	U	250	U	25	U	25	U	25	U
Benzo(b)fluoranthene	250	U	25	U	250	U	25	U	25	U	25	U
Benzo(k)fluoranthene	250	U	25	U	250	U	25	U	25	U	25	U
Benzo(a)pyrene	250	U	25	U	250	U	25	U	25	U	25	U
Indeno(1,2,3-cd)pyrene	250	U	25	U	250	U	25	U	25	U	25	U
Dibenzo(a,h)anthracene	250	U	25	U	250	U	25	U	25	U	25	U
Benzo(g,h,i)perylene	250	U	25	U	250	U	25	U	25	U	25	U
Carbazole	250	U	25	U	250	U	25	U	25	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. Lionville Laboratory
Semivolatiles by GC/MS, HSL List

Report Date: 02/20/96 15:31

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 4a

Cust ID:	SBLKSX		SBLKSX BS		SBLKSX BSD	
Sample Information RFW#:	96LE0236-MB1		96LE0236-MB1		96LE0236-MB1	
Matrix:	AIR		AIR		AIR	
D.F.:	2.50		2.50		2.50	
Units:	total ug		total ug		total ug	
Surrogate Recovery Nitrobenzene-d5	53	%	71	%	70	%
2-Fluorobiphenyl	67	%	89	%	89	%
p-Terphenyl-d14	72	%	94	%	89	%
Phenol-d5	48	%	62	%	63	%
2-Fluorophenol	79	%	102	%	105	%
2,4,6-Tribromophenol	56	%	74	%	71	%
Phenol	25	U	51	%	51	%
bis(2-Chloroethyl)ether	25	U	25	U	25	U
2-Chlorophenol	25	U	66	%	65	%
1,3-Dichlorobenzene	25	U	25	U	25	U
1,4-Dichlorobenzene	25	U	55	%	57	%
Benzyl alcohol	25	U	25	U	25	U
1,2-Dichlorobenzene	25	U	25	U	25	U
2-Methylphenol	25	U	25	U	25	U
bis(2-Chloroisopropyl)ether	25	U	25	U	25	U
4-Methylphenol	25	U	25	U	25	U
N-Nitroso-Di-n-propylamine	25	U	63	%	62	%
Hexachloroethane	25	U	25	U	25	U
Nitrobenzene	25	U	25	U	25	U
Isophorone	25	U	25	U	25	U
2-Nitrophenol	25	U	25	U	25	U
2,4-Dimethylphenol	25	U	25	U	25	U
Benzoic acid	120	U	120	U	120	U
bis(2-Chloroethoxy)methane	25	U	25	U	25	U
2,4-Dichlorophenol	25	U	25	U	25	U
1,2,4-Trichlorobenzene	25	U	65	%	66	%
Naphthalene	25	U	25	U	25	U
4-Chloroaniline	25	U	25	U	25	U
Hexachlorobutadiene	25	U	25	U	25	U
4-Chloro-3-methylphenol	25	U	77	%	75	%
2-Methylnaphthalene	25	U	25	U	25	U
Hexachlorocyclopentadiene	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L963 Client: COE-HOT GAS Work Order: 02281012012 Page: 4b

Cust ID:	SBLKSX		SBLKSX BS		SBLKSX BSD	
RFW#:	96LE0236-MB1		96LE0236-MB1		96LE0236-MB1	
2,4,6-Trichlorophenol	25	U	25	U	25	U
2,4,5-Trichlorophenol	120	U	120	U	120	U
2-Chloronaphthalene	25	U	25	U	25	U
2-Nitroaniline	120	U	120	U	120	U
Dimethylphthalate	25	U	25	U	25	U
Acenaphthylene	25	U	25	U	25	U
2,6-Dinitrotoluene	25	U	25	U	25	U
3-Nitroaniline	120	U	120	U	120	U
Acenaphthene	25	U	76	%	75	%
2,4-Dinitrophenol	120	U	120	U	120	U
4-Nitrophenol	120	U	54	%	58	%
Dibenzofuran	25	U	25	U	25	U
2,4-Dinitrotoluene	25	U	77	%	76	%
Diethylphthalate	25	U	25	U	25	U
4-Chlorophenyl-phenylether	25	U	25	U	25	U
Fluorene	25	U	25	U	25	U
4-Nitroaniline	120	U	120	U	120	U
4,6-Dinitro-2-methylphenol	120	U	120	U	120	U
N-Nitrosodiphenylamine (1)	25	U	25	U	25	U
4-Bromophenyl-phenylether	25	U	25	U	25	U
Hexachlorobenzene	25	U	25	U	25	U
Pentachlorophenol	120	U	83	%	82	%
Phenanthrene	25	U	25	U	25	U
Anthracene	25	U	25	U	25	U
Di-n-Butylphthalate	25	U	25	U	25	U
Fluoranthene	25	U	25	U	25	U
Pyrene	25	U	81	%	76	%
Butylbenzylphthalate	25	U	25	U	25	U
3,3'-Dichlorobenzidine	50	U	50	U	50	U
Benzo(a)anthracene	25	U	25	U	25	U
Chrysene	25	U	25	U	25	U
bis(2-Ethylhexyl)phthalate	25	U	25	U	25	U
Di-n-Octyl phthalate	25	U	25	U	25	U
Benzo(b)fluoranthene	25	U	25	U	25	U
Benzo(k)fluoranthene	25	U	25	U	25	U
Benzo(a)pyrene	25	U	25	U	25	U
Indeno(1,2,3-cd)pyrene	25	U	25	U	25	U
Dibenzo(a,h)anthracene	25	U	25	U	25	U
Benzo(g,h,i)perylene	25	U	25	U	25	U
Carbazole	25	U	25	U	25	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

CASE NARRATIVE

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW# : 9602L963

W.O. #: 02281-012-012-1200-00
Date Received: 07 February 1996

SEMIVOLATILE

The set of samples consisted of five (5) air samples collected on 02 and 04 1996. Each sampling train consisted of three fractions: condensate, solid (filter/XAD), and solvent; each fraction was analyzed and reported individually.

These samples were prepared for Method 8330 analyses on 07 and 08 February 1996; and processed for Method 8270 on 09 and 14 February 1996, and analyzed according to criteria set forth in SW 846 Method 8270 for TCL Semivolatile target compounds on 11,13,17,19 and 20 February 1996.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. Four (4) mL portions of the 8330 Acetonitrile extracts were spiked with Semivolatile surrogates and partitioned into Methylenechloride. Due to the presence of Acetonitrile in the initial extracts, poor chromatography was observed in the Semivolatile analysis for samples AFTOUT-EXPLSV-R2COMP, AFTOUT-EXPLSV-R3COND, AFTOUT-EXPLSV-BTCOND, AFTOUT-EXPLSV-R2-FX, AFTOUT-EXPLSV-R3-FX and AFTOUT-EXPLSV-BT-FX. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

2. All required holding times for extraction and analysis were met.

3. Non-target compounds were detected in these samples.

4. Three (3) of one-hundred-twenty-six (126) surrogate recoveries were outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met {i.e., no more than one outlier per fraction (acid and base neutral) and no recoveries less than 10%}.

5. Two (2) of forty-four (44) blank spike recoveries were outside EPA QC limits.

6. The method blank 96LE0209-MB1 contained the target compound Pentachlorophenol and the common contaminant Bis (2-Ethylhexyl)phthalate at levels less than the CRQL.

7. All internal standard area and retention time criteria were met.

8. The sample IDs for this set of samples were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters on Organic CLP forms.

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-22-96
Date

sb/bna/02-963b.cn

WESTON

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

WESTON

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

QC SUMMARY

2D

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot No.: 9602L963

	CLIENT SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	OTHER	TOT OUT
01	AFTOUT-EXPLSV-R2COMP	67	68	83	55	80	84		0
02	AFTOUT-EXPLSV-R3COND	65	62	91	50	69	82		0
03	AFTOUT-EXPLSV-BTCOND	61	72	81	52	72	75		0
04	AFTIN-EXP-R2-COND	61	55	83	53	104	48		0
05	AFTIN-EXP-R3-COND	63	51	67	49	106	49		0
06	AFTOUT-EXPLSV-R2-FB	74	66	94	68	82	71		0
07	AFTOUT-EXPLSV-R2-FX	92	76	104	75	95	73		0
08	AFTOUT-EXPLSV-R3-FB	73	63	99	65	77	72		0
09	AFTOUT-EXPLSV-R3-FX	90	74	101	77	91	75		0
10	AFTOUT-EXPLSV-BT-FB	69	64	93	61	68	62		0
11	AFTOUT-EXPLSV-BT-FX	93	68	109	73	92	72		0
12	AFTIN-EXP-R2-FB	70	79	105	68	113	76		0
13	AFTIN-EXP-R2-FX	31	33	64	30	45	44		0
14	AFTIN-EXP-R3-FB	54	66	87	52	73	60		0
15	AFTIN-EXP-R3-FX	56	68	87	57	80	71		0
16	SBLKSOLE0209-MB1	74	75	81	19 *	46	68		1
17	SBLKSOLE0209-MB1 BS	72	82	84	19 *	36	91		1
18	SBLKSOLE0209-MB1 BSD	66	77	75	17 *	31	84		1
19	SBLKSXLE0236-MB1	53	67	72	48	79	56		0
20	SBLKSXLE0236-MB1 BS	71	89	94	62	102	74		0
21	SBLKSXLE0236-MB1 BSD	70	89	89	63	105	71		0

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(23-120)
S2 (FBP)	= 2-Fluorobiphenyl	(30-115)
S3 (TPH)	= p-Terphenyl-d14	(18-137)
S4 (PHL)	= Phenol-d5	(24-113)
S5 (2FP)	= 2-Fluorophenol	(25-121)
S6 (TBP)	= 2,4,6-Tribromophenol	(19-122)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogates diluted out

3D

SOIL SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot No.: 9602L963

BLANK Spike - Sample No.: SBLKSOLE0209-MB1 Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/L	SAMPLE CONCENTRATION UG/L	BS CONCENTRATION UG/L	BS % REC #	QC LIMITS REC
Phenol	250	0	44.9	18 *	26 - 90
2-Chlorophenol	250	0	163	65	25 -102
1,4-Dichlorobenzene	125	0	80.7	65	28 -104
N-Nitroso-Di-n-propylamine	125	0	96.2	77	41 -126
1,2,4-Trichlorobenzene	125	0	90.7	73	38 -107
4-Chloro-3-methylphenol	250	0	187	75	26 -103
Acenaphthene	125	0	93.1	75	31 -137
4-Nitrophenol	250	0	47.2	19	11 -114
2,4-Dinitrotoluene	125	0	102	82	28 - 89
Pentachlorophenol	250	3.32	199	78	17 -109
Pyrene	125	0	96.8	77	35 -142

COMPOUND	SPIKE ADDED UG/L	BSD CONCENTRATION UG/L	BSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	250	41.4	17 *	5	35	26 - 90
2-Chlorophenol	250	149	59	9	50	25 -102
1,4-Dichlorobenzene	125	72.9	58	11	27	28 -104
N-Nitroso-Di-n-propylamine	125	87.6	70	9	38	41 -126
1,2,4-Trichlorobenzene	125	84.0	67	8	23	38 -107
4-Chloro-3-methylphenol	250	171	68	9	33	26 -103
Acenaphthene	125	86.8	69	8	19	31 -137
4-Nitrophenol	250	48.2	19	0	50	11 -114
2,4-Dinitrotoluene	125	94.6	76	7	47	28 - 89
Pentachlorophenol	250	208	82	5	47	17 -109
Pyrene	125	85.4	68	12	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 2 out of 22 outside limits

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE/BLANK SPIKE DUPLICATE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot No.: 9602L963

BLANK Spike - Sample No.: SBLKSXLE0236-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	BS CONCENTRATION UG/KG	BS % REC #	QC LIMITS REC
Phenol	250	0	126	51	26 - 90
2-Chlorophenol	250	0	164	66	25 -102
1,4-Dichlorobenzene	125	0	68.3	55	28 -104
N-Nitroso-Di-n-propylamine	125	0	78.4	63	41 -126
1,2,4-Trichlorobenzene	125	0	81.2	65	38 -107
4-Chloro-3-methylphenol	250	0	194	77	26 -103
Acenaphthene	125	0	95.2	76	31 -137
4-Nitrophenol	250	0	136	54	11 -114
2,4-Dinitrotoluene	125	0	95.7	77	28 - 89
Pentachlorophenol	250	0	207	83	17 -109
Pyrene	125	0	101	81	35 -142

COMPOUND	SPIKE ADDED UG/KG	BSD CONCENTRATION UG/KG	BSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	250	129	51	0	35	26 - 90
2-Chlorophenol	250	163	65	1	50	25 -102
1,4-Dichlorobenzene	125	71.4	57	3	27	28 -104
N-Nitroso-Di-n-propylamine	125	78.1	62	1	38	41 -126
1,2,4-Trichlorobenzene	125	82.6	66	1	23	38 -107
4-Chloro-3-methylphenol	250	187	75	2	33	26 -103
Acenaphthene	125	93.8	75	1	19	31 -137
4-Nitrophenol	250	145	58	7	50	11 -114
2,4-Dinitrotoluene	125	94.6	76	1	47	28 - 89
Pentachlorophenol	250	205	82	1	47	17 -109
Pyrene	125	95.0	76	6	36	35 -142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS:

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021103

Lab Sample ID: 96LE0209-MB1

Date Extracted: 02/09/96

Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 02/11/96

Time Analyzed: 1123

Matrix:(Soil/Water) AIR

Level:(low/med) LOW

Instrument ID: 4500V

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLKSOLE0209-MB1 BS	96LE0209-MB1S	V021104	02/11/96
02	SBLKSOLE0209-MB1 BSD	96LE0209-MB1T	V021105	02/11/96
03	AFTOUT-EXPLSV-R2COMP	9602L963-004	V021112	02/11/96
04	AFTOUT-EXPLSV-R3COND	9602L963-009	V021113	02/11/96
05	AFTOUT-EXPLSV-BTCOND	9602L963-014	V021114	02/11/96
06	AFTOUT-EXPLSV-R2-FB	9602L963-026	V021308	02/13/96
07	AFTOUT-EXPLSV-R2-FX	9602L963-027	V021309	02/13/96
08	AFTOUT-EXPLSV-R3-FB	9602L963-028	V021310	02/13/96
09	AFTOUT-EXPLSV-R3-FX	9602L963-029	V021311	02/13/96
10	AFTOUT-EXPLSV-BT-FB	9602L963-030	V021312	02/13/96
11	AFTOUT-EXPLSV-BT-FX	9602L963-031	V021313	02/13/96

COMMENTS:

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021703   Lab Sample ID: 96LE0236-MB1

Date Extracted: 02/14/96   Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 02/17/96   Time Analyzed: 1113

Matrix:(Soil/Water) AIR   Level:(low/med) LOW

Instrument ID: 4500V

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	SBLKSXLE0236-MB1 BS	96LE0236-MB1S	V021704	02/17/96
02	SBLKSXLE0236-MB1 BSD	96LE0236-MB1T	V021705	02/17/96
03	AFTIN-EXP-R2-FB	9602L963-032	V021714	02/17/96
04	AFTIN-EXP-R2-FX	9602L963-033	V021905	02/19/96
05	AFTIN-EXP-R3-FB	9602L963-034	V021906	02/19/96
06	AFTIN-EXP-R3-FX	9602L963-035	V021907	02/19/96
07	AFTIN-EXP-R2-COND	9602L963-019	V022003	02/20/96
08	AFTIN-EXP-R3-COND	9602L963-024	V022004	02/20/96

COMMENTS:

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V020801 DFTPP Injection Date: 02/08/96

Instrument ID: 4500V DFTPP Injection Time: 0830

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	55.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	63.2
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	53.8
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.1
275	10.0 - 30.0% of mass 198	26.9
365	Greater than 1.00% of mass 198	4.52
441	Present, but less than mass 443	7.2
442	Greater than 40.0% of mass 198	61.2
443	17.0 - 23.0% of mass 442	11.8 (19.3)2

1-Value is % mass 69 2-Value is % mass 442

OK
DAF 2/22/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V020802	02/08/96	0908
02	SSTD80	SSTD80	V020803	02/08/96	1108
03	SSTD120	SSTD120	V020804	02/08/96	1157
04	SSTD160	SSTD160	V020805	02/08/96	1246
05	SSTD20	SSTD20	V020806	02/08/96	1336
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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021101 DFTPP Injection Date: 02/11/96

Instrument ID: 4500V DFTPP Injection Time: 0854

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	42.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	44.0
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	46.2
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	23.5
365	Greater than 1.00% of mass 198	2.97
441	Present, but less than mass 443	5.8
442	Greater than 40.0% of mass 198	47.1
443	17.0 - 23.0% of mass 442	9.0 (19.1)2

1-Value is % mass 69 2-Value is % mass 442

OK
DAT 2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021102	02/11/96	0941
02	SBLKSOLE0209-MB1	96LE0209-MB1	V021103	02/11/96	1123
03	SBLKSOLE0209-MB1 BS	96LE0209-MB1S	V021104	02/11/96	1212
04	SBLKSOLE0209-MB1 BSD	96LE0209-MB1T	V021105	02/11/96	1301
05	AFTOUT-EXPLSV-R2COMP	9602L963-004	V021112	02/11/96	1845
06	AFTOUT-EXPLSV-R3COND	9602L963-009	V021113	02/11/96	1934
07	AFTOUT-EXPLSV-BTCOND	9602L963-014	V021114	02/11/96	2024
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021301 DFTPP Injection Date: 02/13/96

Instrument ID: 4500V DFTPP Injection Time: 1044

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	51.5
68	Less than 2.0% of mass 69	0.4 (0.78)1
69	Mass 69 relative abundance	55.6
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	56.6
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 30.0% of mass 198	22.1
365	Greater than 1.00% of mass 198	3.42
441	Present, but less than mass 443	6.0
442	Greater than 40.0% of mass 198	50.7
443	17.0 - 23.0% of mass 442	9.8 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

OK DAT 3/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021303	02/13/96	1229
02	SSTD80	SSTD80	V021304	02/13/96	1342
03	SSTD120	SSTD120	V021305	02/13/96	1431
04	SSTD160	SSTD160	V021306	02/13/96	1520
05	SSTD20	SSTD20	V021307	02/13/96	1610
06	AFTOUT-EXPLSV-R2-FB	9602L963-026	V021308	02/13/96	1748
07	AFTOUT-EXPLSV-R2-FX	9602L963-027	V021309	02/13/96	1837
08	AFTOUT-EXPLSV-R3-FB	9602L963-028	V021310	02/13/96	1926
09	AFTOUT-EXPLSV-R3-FX	9602L963-029	V021311	02/13/96	2015
10	AFTOUT-EXPLSV-BT-FB	9602L963-030	V021312	02/13/96	2105
11	AFTOUT-EXPLSV-BT-FX	9602L963-031	V021313	02/13/96	2154
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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021601 DFTPP Injection Date: 02/16/96

Instrument ID: 4500V DFTPP Injection Time: 0926

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	39.9
68	Less than 2.0% of mass 69	0.6 (1.3)1
69	Mass 69 relative abundance	49.3
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	55.2
197	Less than 1.0% of mass 198	0.7
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.6
275	10.0 - 30.0% of mass 198	28.3
365	Greater than 1.00% of mass 198	5.50
441	Present, but less than mass 443	12.2
442	Greater than 40.0% of mass 198	93.2
443	17.0 - 23.0% of mass 442	17.7 (19.0)2

1-Value is % mass 69 2-Value is % mass 442

Ok
DA
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021602	02/16/96	1010
02	SSTD80	SSTD80	V021603	02/16/96	1148
03	SSTD120	SSTD120	V021604	02/16/96	1237
04	SSTD160	SSTD160	V021605	02/16/96	1326
05	SSTD20	SSTD20	V021606	02/16/96	1416
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021701 DFTPP Injection Date: 02/17/96

Instrument ID: 4500V DFTPP Injection Time: 0849

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	33.2
68	Less than 2.0% of mass 69	0.7 (1.4)1
69	Mass 69 relative abundance	45.6
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	52.9
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.2
275	10.0 - 30.0% of mass 198	29.1
365	Greater than 1.00% of mass 198	5.46
441	Present, but less than mass 443	10.9
442	Greater than 40.0% of mass 198	83.5
443	17.0 - 23.0% of mass 442	16.1 (19.3)2

1-Value is % mass 69 2-Value is % mass 442

Eh RAF 3/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021702	02/17/96	0923
02	SBLKSXLE0236-MB1	96LE0236-MB1	V021703	02/17/96	1113
03	SBLKSXLE0236-MB1 BS	96LE0236-MB1S	V021704	02/17/96	1201
04	SBLKSXLE0236-MB1 BSD	96LE0236-MB1T	V021705	02/17/96	1251
05	AFTIN-EXP-R2-FB	9602L963-032	V021714	02/17/96	2014
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SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V021901 DFTPP Injection Date: 02/19/96

Instrument ID: 4500V DFTPP Injection Time: 0846

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	31.3
68	Less than 2.0% of mass 69	0.5 (1.2)1
69	Mass 69 relative abundance	45.4
70	Less than 2.0% of mass 69	0.3 (0.69)1
127	40.0 - 60.0% of mass 198	53.6
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 30.0% of mass 198	29.5
365	Greater than 1.00% of mass 198	6.24
441	Present, but less than mass 443	11.5
442	Greater than 40.0% of mass 198	90.4
443	17.0 - 23.0% of mass 442	16.9 (18.7)2

1-Value is % mass 69 2-Value is % mass 442

Chk DAF 2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V021902	02/19/96	0921
02	AFTIN-EXP-R2-FX	9602L963-033	V021905	02/19/96	1222
03	AFTIN-EXP-R3-FB	9602L963-034	V021906	02/19/96	1311
04	AFTIN-EXP-R3-FX	9602L963-035	V021907	02/19/96	1400
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5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS

Lab File ID: V022001 DFTPP Injection Date: 02/20/96

Instrument ID: 4500V DFTPP Injection Time: 1059

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	34.6
68	Less than 2.0% of mass 69	0.4 (0.78)1
69	Mass 69 relative abundance	53.6
70	Less than 2.0% of mass 69	0.3 (0.56)1
127	40.0 - 60.0% of mass 198	56.6
197	Less than 1.0% of mass 198	0.6
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 30.0% of mass 198	27.7
365	Greater than 1.00% of mass 198	4.97
441	Present, but less than mass 443	7.6
442	Greater than 40.0% of mass 198	60.5
443	17.0 - 23.0% of mass 442	11.2 (18.6)2

1-Value is % mass 69 2-Value is % mass 442

OK
DA
2/20/96

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD50	SSTD50	V022002	02/20/96	1149
02	AFTIN-EXP-R2-COND	9602L963-019	V022003	02/20/96	1314
03	AFTIN-EXP-R3-COND	9602L963-024	V022004	02/20/96	1403
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L963

Lab File ID (Standard): V021102 Date Analyzed: 02/11/96

Instrument ID: 4500V Time Analyzed: 0941

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	26253	9.000	118200	12.933	72624	18.533
	UPPER LIMIT	52506	9.50	236400	13.43	145248	19.03
	LOWER LIMIT	13127	8.50	59100	12.43	36312	18.03
	CLIENT SAMPLE NO.						
01	AFTOUT-EXPLSV-R2COMP	32408	8.967	115627	12.917	77954	18.533
02	AFTOUT-EXPLSV-R3COND	30942	8.933	105050	12.917	76161	18.533
03	AFTOUT-EXPLSV-BTCOND	32061	8.967	114110	12.917	78212	18.533
04	SBLKSOLE0209-MB1	34581	9.317	115633	13.050	75023	18.567
05	SBLKSOLE0209-MB1 BS	23976	8.967	124180	12.917	87110	18.533
06	SBLKSOLE0209-MB1 BSD	24764	8.967	129296	12.917	88401	18.533

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L963

Lab File ID (Standard): V021102 Date Analyzed: 02/11/96

Instrument ID: 4500V Time Analyzed: 0941

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	110253	23.183	74447	29.383	59131	33.267
	UPPER LIMIT	220506	23.68	148894	29.88	118262	33.77
	LOWER LIMIT	55127	22.68	37224	28.88	29566	32.77
	CLIENT SAMPLE NO.						
01	AFTOUT-EXPLSV-R2COMP	97984	23.183	93577	29.433	87669	33.317
02	AFTOUT-EXPLSV-R3COND	124635	23.183	101426	29.400	87118	33.300
03	AFTOUT-EXPLSV-BTCOND	120330	23.183	95835	29.450	87020	33.350
04	SBLKSOLE0209-MB1	106581	23.200	102250	29.450	86605	33.350
05	SBLKSOLE0209-MB1 BS	138053	23.167	120368	29.333	103835	33.217
06	SBLKSOLE0209-MB1 BSD	138599	23.167	128902	29.367	110335	33.267

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L963

Lab File ID (Standard): V021303

Date Analyzed: 02/13/96

Instrument ID: 4500V

Time Analyzed: 1229

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	23446	9.033	92464	12.917	51916	18.500
	UPPER LIMIT	46892	9.53	184928	13.42	103832	19.00
	LOWER LIMIT	11723	8.53	46232	12.42	25958	18.00
	CLIENT SAMPLE NO.						
01	AFTOUT-EXPLSV-R2-FB	20461	8.917	80469	12.867	51197	18.483
02	AFTOUT-EXPLSV-R2-FX	22341	8.933	76913	12.867	50871	18.483
03	AFTOUT-EXPLSV-R3-FB	22737	8.917	88929	12.867	56327	18.483
04	AFTOUT-EXPLSV-R3-FX	20178	8.933	70776	12.867	49491	18.483
05	AFTOUT-EXPLSV-BT-FB	20533	8.933	78412	12.883	49018	18.500
06	AFTOUT-EXPLSV-BT-FX	21120	8.850	69951	12.883	47836	18.483

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

FORM VIII SV-1

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8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L963

Lab File ID (Standard): V021303

Date Analyzed: 02/13/96

Instrument ID: 4500V

Time Analyzed: 1229

		IS4 (PHN) AREA	#	RT	IS5 (CRY) AREA	#	RT	IS6 (PRY) AREA	#	RT
	12 HOUR STD	72422		23.133	38331		29.483	28141		33.400
	UPPER LIMIT	144844		23.63	76662		29.98	56282		33.90
	LOWER LIMIT	36211		22.63	19166		28.98	14071		32.90
	CLIENT SAMPLE NO.									
01	AFTOUT-EXPLSV-R2-FB	78706		23.133	50014		29.417	37471		33.300
02	AFTOUT-EXPLSV-R2-FX	68960		23.133	44584		29.417	31811		33.317
03	AFTOUT-EXPLSV-R3-FB	85668		23.133	50280		29.400	38267		33.283
04	AFTOUT-EXPLSV-R3-FX	70247		23.133	43994		29.367	32690		33.250
05	AFTOUT-EXPLSV-BT-FB	77513		23.150	46045		29.433	35691		33.317
06	AFTOUT-EXPLSV-BT-FX	77318		23.133	42016		29.417	31104		33.317

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L963

Lab File ID (Standard): V021702 Date Analyzed: 02/17/96

Instrument ID: 4500V Time Analyzed: 0923

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	15343	9.033	79377	12.933	55942	18.517
	UPPER LIMIT	30686	9.53	158754	13.43	111884	19.02
	LOWER LIMIT	7672	8.53	39689	12.43	27971	18.02
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R2-FB	30444	8.933	113029	12.883	79977	18.500
02	SBLKSXLE0236-MB1	16389	9.050	92732	12.933	66762	18.500
03	SBLKSXLE0236-MB1 BS	18152	8.950	97286	12.900	67158	18.500
04	SBLKSXLE0236-MB1 BSD	20937	8.933	110507	12.883	74066	18.500

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L963

Lab File ID (Standard): V021702 Date Analyzed: 02/17/96

Instrument ID: 4500V Time Analyzed: 0923

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	99241	23.150	90900	29.350	70658	33.217
	UPPER LIMIT	198482	23.65	181800	29.85	141316	33.72
	LOWER LIMIT	49621	22.65	45450	28.85	35329	32.72
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R2-FB	124952	23.167	105986	29.383	98126	33.233
02	SBLKSXLE0236-MB1	102014	23.150	110707	29.400	112424	33.267
03	SBLKSXLE0236-MB1 BS	104483	23.167	110278	29.383	112934	33.267
04	SBLKSXLE0236-MB1 BSD	113166	23.150	126026	29.417	123967	33.300

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc. Contract: 2281-12-12

Case No.: COE-HOT GAS RFW Lot: 9602L963

Lab File ID (Standard): V021902 Date Analyzed: 02/19/96

Instrument ID: 4500V Time Analyzed: 0921

		IS1 (DCB) AREA #	RT	IS2 (NPT) AREA #	RT	IS3 (ANT) AREA #	RT
	12 HOUR STD	19365	9.017	100772	12.883	70013	18.467
	UPPER LIMIT	38730	9.52	201544	13.38	140026	18.97
	LOWER LIMIT	9683	8.52	50386	12.38	35007	17.97
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R2-FX	30648	8.900	119152	12.850	78806	18.450
02	AFTIN-EXP-R3-FB	31178	8.883	126515	12.833	79483	18.450
03	AFTIN-EXP-R3-FX	33974	8.900	139098	12.833	87786	18.450

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L963

Lab File ID (Standard): V021902

Date Analyzed: 02/19/96

Instrument ID: 4500V

Time Analyzed: 0921

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	108998	23.100	79531	29.400	56356	33.267
	UPPER LIMIT	217996	23.60	159062	29.90	112712	33.77
	LOWER LIMIT	54499	22.60	39766	28.90	28178	32.77
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R2-FX	116641	23.100	99347	29.450	85554	33.333
02	AFTIN-EXP-R3-FB	125502	23.100	98644	29.400	79816	33.267
03	AFTIN-EXP-R3-FX	133650	23.100	111955	29.417	86832	33.300

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.

Contract: 2281-12-12

Case No.: COE-HOT GAS

RFW Lot: 9602L963

Lab File ID (Standard): V022002

Date Analyzed: 02/20/96

Instrument ID: 4500V

Time Analyzed: 1149

		IS1 (DCB) AREA	#	RT	IS2 (NPT) AREA	#	RT	IS3 (ANT) AREA	#	RT
	12 HOUR STD	21792		8.967	104115		12.867	71555		18.467
	UPPER LIMIT	43584		9.47	208230		13.37	143110		18.97
	LOWER LIMIT	10896		8.47	52058		12.37	35778		17.97
	CLIENT SAMPLE NO.									
01	AFTIN-EXP-R2-COND	30183		9.050	103002		12.900	69536		18.467
02	AFTIN-EXP-R3-COND	29088		8.900	104139		12.850	72970		18.467

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

FORM VIII SV-1

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8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Roy F. Weston, Inc.   Contract: 2281-12-12

Case No.: COE-HOT GAS   RFW Lot: 9602L963

Lab File ID (Standard): V022002   Date Analyzed: 02/20/96

Instrument ID: 4500V   Time Analyzed: 1149

		IS4 (PHN) AREA #	RT	IS5 (CRY) AREA #	RT	IS6 (PRY) AREA #	RT
	12 HOUR STD	111985	23.100	77647	29.433	53462	33.300
	UPPER LIMIT	223970	23.60	155294	29.93	106924	33.80
	LOWER LIMIT	55993	22.60	38824	28.93	26731	32.80
	CLIENT SAMPLE NO.						
01	AFTIN-EXP-R2-COND	102648	23.117	77004	29.417	63466	33.283
02	AFTIN-EXP-R3-COND	112825	23.117	82797	29.367	67600	33.233

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

WESTON

SAMPLE DATA

ADDITIONAL DOCUMENTATION

Roy [illegible]eston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/08/96 Extraction Batch No: 96LLC017 Analyst: GL Method: ****

Test: 0833 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/09/96 Solvent: DCM/ACETONE TO ACN Adsorbent:

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
006 0	IN/OUT-EXP/SV-SB-ACE	7	1	1.0		10		2.0	N	0.0	20.0
020 0	AFTOUT-EXP/SV-R1-FB	7	1	1.0		10		2.0	N	0.0	20.0
023 0	AFTIN-EXP-R1-FB	7	1	1.0		10		2.0	N		20.0
025 0	AFTIN-EXP-R1MS-FB	7	1	1.0		10		2.0	N		20.0
9602L963-	COE-HOT GAS										
026 0	AFTOUT-EXPLSV-R2-FB	7	1	1.0		10		2.0	N		20.0
028 0	AFTOUT-EXPLSV-R3-FB	7	1	1.0		10		2.0	N		20.0
030 0	AFTOUT-EXPLSV-BT-FB	7	1	1.0		10		2.0	N		20.0
032 0	AFTIN-EXP-R2-FB	7	1	1.0		10		2.0	N	0.0	20.0
034 0	AFTIN-EXP-R3-FB	7	1	1.0		10		2.0	N	0.0	20.0
96LLC017-MB1 0	BLK	7	1	1.0		10		2.0	N		20.0
96LLC017-MB1 0S	BLK	7	1	1.0	1.0	10		2.0	N		20.0

Comments: ALL REQUIRED FILTRATION THROGH SODIUM SULFATE
Surrogate: 50UL 41024101 1,2-DNB
Spike: 125UL 461129B

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
N/A					

GL 2/9/96

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 02/09/96 Extraction Batch No: 96LE0209 Analyst: DW Method: SEPF

Test: 0625 Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/15/96 Solvent: DCM Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L916-	COE-HOT GAS										
004 H	AFTOUT-EXP/SV-R1-CND			2.5		2.0		1.25	N		2.5
006 H	IN/OUT-EXP/SV-SB-ACE			2.5		2.0		1.25	N		2.5
009 H	IN/OUT-EXP/SV-SB-CND			2.5		2.0		1.25	N		2.5
020 H	AFTOUT-EXP/SV-R1-FB			2.5		2.0		1.25	N		2.5
021 H	AFTOUT-EXP/SV-R1-FX			25.0		2.0		12.5	N		25.0
022 H	IN/OUT-EXP/SV-SB-FX			25.0		2.0		12.5	N		25.0
9602L963-	COE-HOT GAS										
004 H	AFTOUT-EXPLSV-R2COMP			2.5		2.0		1.25	N		2.5
009 H	AFTOUT-EXPLSV-R3COND			2.5		2.0		1.25	N		2.5
014 H	AFTOUT-EXPLSV-BTCOND			2.5		2.0		1.25	N		2.5
026 H	AFTOUT-EXPLSV-R2-FB			2.5		2.0		1.25	N		2.5
027 H	AFTOUT-EXPLSV-R2-FX			25.0		2.0		12.5	N		25.0
028 H	AFTOUT-EXPLSV-R3-FB			2.5		2.0		1.25	N		2.5
029 H	AFTOUT-EXPLSV-R3-FX			25.0		2.0		12.5	N		25.0
030 H	AFTOUT-EXPLSV-BT-FB			2.5		2.0		1.25	N		2.5
031 H	AFTOUT-EXPLSV-BT-FX			25.0		2.0		12.5	N		25.0
96LE0209-MB1 H	SBLKSO			2.5		2.0		1.25	N		2.5
96LE0209-MB1 HS	SBLKSO			2.5	2.5	2.0		1.25	N		2.5
96LE0209-MB1 HT	SBLKSO			2.5	2.5	2.0		1.25	N		2.5

Comments:
Surrogate: 500 UL ESU 71A @ 100/200 UG/ML
Spike: 500 UL EMS 28 @ 100/200 UG/ML

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
n/A	AWDe	2/15/96 6:15P	C Taylor	1709 2/15/96	"Precision"

surrogate multiplier & GPC for blanks

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 46LLC0.3 SDG File Y/N: N/A

Analyst: F [illegible] Test: 8330 Method: RSOE Solvent: ACN AAPrep: ⊥

	RFW #	(mL) Vol I	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank	(770)	W		1	1.0 LOT	[illegible]	10	2	N
2	Blank Spike	(770)			1		1.0 LOT			
3	9602L916-C04	(580)			1					
4	-C09	(330)			1					
5	-C13*	(400)			1					
6	-C18	(310)			1					
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

[illegible] 2/8/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: N/A

End time: ⊥

BN Fraction (Date/Time/Initials)

Start time: N/A

End time: ⊥

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: [illegible] 2/8/96

GPC Lab ID #: N/A

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to volume (770mls) w/ DI H2O
* Bright Yellow Extract => potentially high tgt Cmpds

Surrogate: 50ul 41C24[illegible] Spike: 125ul 461129B Witness:

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: [illegible] 2/8/96

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/7/96 Extraction Batch #: 16LLC014 SDG File Y/N: ______

Analyst: [illegible] Test: 8330 Method: Sonc Solvent: ACN AAPrep: ______

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L916-021	Air			10		100	2	N
2	022								
3	024								
4	026								
5	Blank								
6	BS					10			
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

[initials] 2/8/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ______

End time: ______

BN Fraction (Date/Time/Initials)

Start time: ______

End time: ______

Extraction Information (Date/Analyst)

Filtration: ______

Boildown: ______

Blowdown: ______

GPC Ready: ______

GPC Cleanup: ______

GPC #: ______

After GPC Boildown: ______

After GPC Blowdown: ______

Acid/Florisil/Alumina Cleanup: ______

Prep Sheet: [initials] 2/8/96

GPC Lab ID #: ______

Florisil Lot #: ______

Florisil Lab ID #: ______

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Composite XAD + filter for the above numbered RFW. See COC for original sample ID. [initials] 2/7/96

ON: 1550 2/7/96

OFF: 0950 2/8/96 [initials]

Surrogate: 40uL 4102071W 1,2DNB @ 1000 ug/mL Spike: 1.25mL 4611298 [initials] Witness: ______

This Page Reviewed By/Date: [signature] 2/9/96 Reviewed Against LIMS By/DATE: [signature] 2/5/96

RFW 21-21-019/Z-11/93

WESTON® LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

SDG File Y/N: N/A

Extract Date: 2/8/96 Extraction Batch #: 96LLC015 AAPrep:

Analyst: F [illegible] Test: 8330 Method: 8SOE Solvent: ACN

	RFW #	Vol (mL)	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	Blank	(770)	W		1 (770)	1		10	2	N
2	Blank Spike	(770)					1			
3	96021963 - 004	(550)								
4	-009	(539)								
5	-014**	(200)								
6	-019*	(310)								
7	-024*	(310)								
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										

2/8/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time: N/A

End time:

BN Fraction (Date/Time/Initials)

Start time: N/A

End time:

Extraction Information (Date/Analyst)

Filtration: N/A

Boildown:

Blowdown:

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup: N/A

Prep Sheet: [illegible] 2/8/96

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: Samples brought to Volume (770 mls) w/ DI H_2O

* Bright Yellow Extracts [illegible] high test Compounds

xx Sample 014 produced 30 mls H2O after [illegible] Additional (~ 50 mls) Salt water

Only added 2 mls ACN on 2nd spin. 22 mL FV [illegible] for [illegible]

Surrogate: 50 uL 414[illegible]4009 Spike: 125 uL 461129 B Witness:

This Page Reviewed By/Date: [illegible] 2/8/96 Reviewed Against LIMS By/DATE: [illegible] 2/8/96

452 Page #

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LC016 SDG File Y/N: ____

Analyst: Schnell Test: 8330 Method: Sonic Solvent: ACN AAPrep: ____

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96021963-027	Air			10		100	2	N
2	029								
3	031								
4	033								
5	035								
6	Blank								
7	BS					10			
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21			2/8/96						
22									
23									
24									

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ____

End time: ____

BN Fraction (Date/Time/Initials)

Start time: ____

End time: ____

Extraction Information (Date/Analyst)

Filtration: ____

Boildown: ____

Blowdown: ____

GPC Ready: ____

GPC Cleanup: ____

GPC #: ____

After GPC Boildown: ____

After GPC Blowdown: ____

Acid/Florisil/Alumina Cleanup: ____

Prep Sheet: 2/8/96

GPC Lab ID #: ____

Florisil Lot #: ____

Florisil Lab ID #: ____

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: XAD + Filter Composites

ON 1430 2/8/96

OFF 0830 2/9/96

Surrogate: 40 µL 4102470 120NB@100 µg/L Spike: 1.25 mL 4611293 Witness: ____

This Page Reviewed By/Date: 2/8/96 Reviewed Against LIMS By/DATE: 2/8/96

RFW 21-21-019/Z-11/93

WESTON® **LC - GC - GC/MS EXTRACTABLES**

Logbook #: 5055

Extract Date: 2/8/96 Extraction Batch #: 96LLC017 SDG File Y/N: ______

Analyst: G. [illegible] Test: 08330 Method: KD Solvent: ACN AAPrep: 2/8/96

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-006	Sdo		370	1		10	2	N
2	-020			210					
3	-023			240					
4	-025			220					
5	96021963-026			240					
6	-028			210					
7	-030			180					
8	-032			235					
9	-034			325					
10	Blank			200					
11	Blank spike			200		1			
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

G. [illegible] 2/9/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time: ______

End time: ______

BN Fraction (Date/Time/Initials)

Start time: ______

End time: ______

Extraction Information (Date/Analyst)

Filtration: ______

Boildown: ______

Blowdown: ______

GPC Ready: ______

GPC Cleanup: ______

GPC #: ______

After GPC Boildown: ______

After GPC Blowdown: ______

Acid/Florisil/Alumina Cleanup: ______

Prep Sheet: 2/9/96 G[illegible]

GPC Lab ID #: ______

Florisil Lot #: ______

Florisil Lab ID #: ______

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: DCM/ACETONE 50:50 used for B + BS
All initial volumes to be logged in as 1 for total ug.
Water in All samples requiring Sodium Sulfate filtering

Surrogate: Soil 4102410 / 1,2-DNB Spike: 461129B 125 uL Witness: ______

This Page Reviewed By/Date: [illegible] 2/12/96 Reviewed Against LIMS By/DATE: [illegible] 2/12/96

RFW 21-21-019/Z-11/93

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5158

Extract Date: 2/9/96 Extraction Batch #: 96LE0209 SDG File (Y)/N: AMS 2/1[redacted]

Analyst: [illegible] Test: 0625H Method: Sep f. Solvent: DCM AAPrep: D.O 2/9

	RFW #	Mtrx	pH	Initial Wt/Vol (g/mL)	Surr Mult *	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	96022916-004	W	~~7.0~~ N/A	N/A	2.5		2.0	1.25	N
2	-006								
3	-009								
4	-020								
5	-021				25			12.5	
6	-022								
7	96022963-004				2.5			1.25	
8	-009								
9	-014								
10	-026								
11	-027				25			12.5	
12	-028				2.5			1.25	
13	-029				25			12.5	
14	-030				2.5			1.25	
15	-031			2/16/96	25			12.5	
16	Blank		~~7.0~~	~~1000~~	2.5			1.25	
17	BS					2.5			
18	BSD								
19									
20									
21									
22									
23									
24									

[illegible] 2/9/96

Acid Fraction or Pest/PCB or LC (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration: 2/9/96 [illegible]

Boildown:

Blowdown: 2/16/96 AMS

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: AMS 2/10

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table (1)/ 2 / 3 (circle one)

COMMENTS: 4mL of extract was delivered into 200 mL of DI H_2O in sepfunnel. Revision of the prepsheet, reflecting 4ml aliquots taken from 10ml and 100ml F.V.s of explosive extracts, was performed on 2/14/96 by D.O. per. ID. instruction D.O 2/14/96.

Surrogate: 500uL 2/88 ESU-71A 3317501 @100-200~5/mL Spike: 500uL 2/88 EMS-23 3311730 @100-200~5/mL Witness: [redacted]

This Page Reviewed By/Date: AMS 2/16/96 Reviewed Against LIMS By/DATE: AMS 2/16/96

WESTON®

LC - GC - GC/MS EXTRACTABLES

Logbook #: 5158

Extract Date: 2/14/96 Extraction Batch #: 96LE0236 SDG File Y/N: AMS 2/16/9

Analyst: MY Test: 0625H Method: SEPT Solvent: DCM AAPrep: AMS 2/15/9

	RFW #	Mtrx air	pH	Initial Wt/Vol (g/mL)	Surr Mult * D.O. 2/14/96	Spike Mult *	Final Vol (mL)	Split Mult	GPC Y/N
1	9602L916-013	W	N/A	N/A	~~1.0~~ 2.5		2.0	1.25	N
2	018				2.5			1.25	
3	024				25			12.5	
4	026				25			12.5	
5	023				2.5			1.25	
6	025				2.5			1.25	
7	963-019							1.25	
8	-024							1.25	
9	-032							1.25	
10	-033				25			12.5	
11	-034				2.5			1.25	
12	-035				25			12.5	
13	Blank				2.5			1.25	
14	B3					~~1~~ .025		1.25	
15	BSD					1.025 D.O. 2/14/96		1.25	
16					*	*			
17		D.O. 2/14/96							
18									
19									
20									
21									
22									
23									
24									

AMS 2/15/96

Acid Fraction or **Pest/PCB** or **LC** (Date/Time/Initials)

Start time:

End time:

BN Fraction (Date/Time/Initials)

Start time:

End time:

Extraction Information (Date/Analyst)

Filtration: 2/14/96 MY

Boildown: 2/14/96 BW

Blowdown: 2/15/96 D.O.

GPC Ready:

GPC Cleanup:

GPC #:

After GPC Boildown:

After GPC Blowdown:

Acid/Florisil/Alumina Cleanup:

Prep Sheet: D.O. 2/15/96

GPC Lab ID #:

Florisil Lot #:

Florisil Lab ID #:

* For Surr/Spike Mult, refer to Table 1 / 2 / 3 (circle one)

COMMENTS: PH & Initial Wt Volume was not applicable according to Schedule. MY 2/14/96 Samples are air — ~~therefore~~ pH and init. vol. — not needed. D.O. 2/14/96.
* Sur. and spike multiplier changed to accom. GC/MS SVOA calculations per S.Du 3311750 ' ~~MY 2/14/96~~

Surrogate: 500 µL ESU71A @ 100/200 V/ml Spike: 500 µL EMS28 33117302 @ Witness: BO

This Page Reviewed By/Date: D.O. 2/15/96 Reviewed Against LIMS By/DATE: AMS 2/16/96

15 ... CKD ... N57

END OF DATA PACKAGE

~~45~~
CHP... 458

Roy F. Weston, Inc. - Lionville Laboratory
VOST ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/02/96 RFW LOT # :9602L915

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-VOST-R1-TP1F	001	AI	96LVX020	01/31/96	N/A	02/07/96
AFTOUT-VOST-R1-TP1B	002	AI	96LVQ015	01/31/96	N/A	02/10/96
AFTOUT-VOST-R1-TP2B	004	AI	96LVQ015	01/31/96	N/A	02/10/96
AFTOUT-VOST-R1-TP3F	005	AI	96LVX020	01/31/96	N/A	02/07/96
AFTOUT-VOST-R1-TP3B	006	AI	96LVQ014	01/31/96	N/A	02/09/96
AFTOUT-VOST-R1-TP4F	007	AI	96LVX020	01/31/96	N/A	02/07/96
AFTOUT-VOST-R1-TP4B	008	AI	96LVQ014	01/31/96	N/A	02/09/96
AFTOUT-VOST-R1-TP5F	009	AI	96LVX020	01/31/96	N/A	02/07/96
AFTOUT-VOST-R1-TP5B	010	AI	96LVQ014	01/31/96	N/A	02/09/96
AFTOUT-VOST-R1-TP6B	012	AI	96LVQ014	01/31/96	N/A	02/09/96
AFTOUT-VOST-BT-TP1F	013	AI	96LVX020	01/31/96	N/A	02/07/96
AFTOUT-VOST-BT-TP1B	014	AI	96LVQ014	01/31/96	N/A	02/09/96
AFTOUT-VOST-R1-COND	015	W	96LVK031	01/31/96	N/A	02/09/96
OUT-VOST-SB-COND	016	W	96LVK031	01/31/96	N/A	02/09/96

LAB QC:

VBLKRC	MB1	AI	96LVX020	N/A	N/A	02/07/96
VBLKRC	MB1 BS	AI	96LVX020	N/A	N/A	02/07/96
VBLKRU	MB1	AI	96LVQ015	N/A	N/A	02/10/96
VBLKRV	MB1	AI	96LVQ014	N/A	N/A	02/09/96
VBLKRV	MB1 BS	AI	96LVQ014	N/A	N/A	02/09/96
VBLKRO	MB1	W	96LVK031	N/A	N/A	02/09/96
VBLKRO	MB1 BS	W	96LVK031	N/A	N/A	02/09/96

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mmz/11-95/toc.88

CHAIN OF CUSTODY

WESTON Analytics Use Only
9602L915

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

604

Client COE - HOT GAS ~~(ROB)~~ (per 2/96)
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # Jeff Orrell
AD Project Manager ~~Jeff~~ KAB
QC STD Del ~~STD~~ CLP TAT ~~STD~~ 14 day
Date Rec'd 2-2-96 Date Due 2/16/96
Account # COEHOTGAS

Refrigerator #		
#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		
ANALYSES REQUESTED →		

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ORGANIC VOA	BNA	Pest/PCB	Herb	INORG Metal	CN	WESTON Analytics Use Only: Volatile Organics 5040 (VOST)	8240 (VOST)
001 002	COE-HG-AFTOUT-VOST-R1-TP1			Air	1/31/96					X				#05508
003 004	COE-HG-AFTOUT-VOST-R1-TP2									X				#05572
005 006	COE-HG-AFTOUT-VOST-R1-TP3									X				#05506
007 008	COE-HG-AFTOUT-VOST-R1-TP4									X				#05507
009 010	COE-HG-AFTOUT-VOST-R1-TP5									X				#05509
011 012	COE-HG-AFTOUT-VOST-R1-TP6									X				#05511
013 014	COE-HG-AFTOUT-VOST-BT-TP1			Air						X				#05510
015	COE-HG-AFTOUT-VOST-R1-COMP			W							X			
016	COE-HG-OUT-VOST-SB-COMP										X			

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions: Analyze Tenax and Tenax/charcoal separately
SW ~~EPA~~ Method 5040/8240

DATE/REVISIONS:
1.
2.
→ 3. ~~Do not log Front + Back~~ 2/12/96
4. ~~0003 per S Durke~~
2/20/96 5. Cancelled #003, 011 per
✝ 6. SDRA 96VT015

Relinquished by	Received by	Date	Time
[signature]			

Relinquished by	Received by	Date	Time
FED EX	T Benin	2-2-96	1:00

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # ___
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample Y or (N)
4) Unbroken on Sample Y or (N)
COC Record Present Upon Sample Rec't (Y) or N

8.5°
8.5°
16.6°
7.4°

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# N/A Cooler# N/A 381-596a

MPS 998 5123 477 temp 4.9°

DATA SUMMARY

Roy F. Weston, Inc. - Lionville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 14:29

RFW Batch Number: **9602L915** Client: **COE-HOT GAS** Work Order: 02281012012 Page: 1a

	Cust ID:	**AFTOUT-VOST-R1-TP1F**		**AFTOUT-VOST-R1-TP1B**		**AFTOUT-VOST-R1-TP2B**		**AFTOUT-VOST-R1-TP3F**		**AFTOUT-VOST-R1-TP3B**		**AFTOUT-VOST-R1-TP4F**	
Sample	RFW#:	001		002		004		005		006		007	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	total ng		total ng		total ng		total ng		total ng		total ng	
	Toluene-d8	102	%	79	%	87	%	104	%	96	%	109	%
Surrogate	Bromofluorobenzene	112	%	117	%	113	%	116	%	130	%	118	%
Recovery	1,2-Dichloroethane-d4	109	%	84	%	93	%	103	%	99	%	113	%
			fl		fl		fl		fl		fl		fl
Chloromethane		50	U	1000		160		50	U		E	50	U
Bromomethane		48	JB	33	J	87		50	U	530		50	U
Vinyl Chloride		50	U	50	U	50	U	50	U	50	U	50	U
Chloroethane		50	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride		16	JB	50	B	21	JB	16	JB	35	B	12	JB
Acetone			E	2400		360	J	1400		500	U	2000	
Carbon Disulfide		25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)		25	U	25	U	25	U	25	U	25	U	25	U
Chloroform		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
2-Butanone		500	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride		25	U	25	U	25	U	25	U	25	U	25	U
Vinyl Acetate		100	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane		25	U	25	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Trichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
Dibromochloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Benzene		91	B	8	JB	6	JB	38	B	8	JB	62	B
Trans-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Bromoform		25	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone		500	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone		500	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane		25	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L915 Client: COE-HOT GAS Work Order: 02281012012 Page: 1b

007

Cust ID:	AFTOUT-VOST-R1-TP1F		AFTOUT-VOST-R1-TP1B		AFTOUT-VOST-R1-TP2B		AFTOUT-VOST-R1-TP3F		AFTOUT-VOST-R1-TP3B		AFTOUT-VOST-R1-TP4F	
RFW#:	001		002		004		005		006		007	
Toluene	40	B	10	J	7	J	27	B	5	J	39	B
Chlorobenzene	25	U	25	U	25	U	25	U	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	25	U	25	U	25	U
Styrene	17	J	25	U	25	U	6	J	25	U	12	J
Xylene (total)	38		25	U	25	U	13	J	25	U	28	
2-chloroethylvinylether	100	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

008

Roy F. Weston, Inc. - Lionville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 14:29

RFW Batch Number: 9602L915 Client: COE-HOT GAS Work Order: 02281012012 Page: 2a

Sample Information												
Cust ID:	AFTOUT-VOST-R1-TP4B		AFTOUT-VOST-R1-TP5F		AFTOUT-VOST-R1-TP5B		AFTOUT-VOST-R1-TP6B		AFTOUT-VOST-BT-TP1F		AFTOUT-VOST-BT-TP1B	
RFW#:	008		009		010		012		013		014	
Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
Units:	total ng		total ng		total ng		total ng		total ng		total ng	
Surrogate Recovery Toluene-d8	106	%	111	%	118	%	137	%	97	%	125	%
Bromofluorobenzene	171 *	%	133	%	189 *	%	219 *	%	114	%	112	%
1,2-Dichloroethane-d4	109	%	115	%	112	%	130	%	102	%	100	%
		fl		fl		fl		fl		fl		fl
Chloromethane		E	50	U		E	1800	B	50	U	270	B
Bromomethane	120		50	U	400		420		5	JB	36	J
Vinyl Chloride	50	U	50	U	50	U	50	U	50	U	50	U
Chloroethane	50	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride	23	JB	6	JB	19	BJ	24	JB	12	JB	25	JB
Acetone	500	U	1700		610		500	U	500	U	500	U
Carbon Disulfide	25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethene	25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane	25	U	25	U	25	U	6	J	25	U	25	U
1,2-Dichloroethene (trans)	25	U	25	U	25	U	6	J	25	U	25	U
Chloroform	25	U	25	U	25	U	8	J	25	U	25	U
1,2-Dichloroethane	25	U	25	U	25	U	25	U	25	U	25	U
2-Butanone	500	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane	25	U	25	U	25	U	6	J	25	U	25	U
Carbon Tetrachloride	25	U	25	U	25	U	6	J	25	U	25	U
Vinyl Acetate	100	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane	25	U	25	U	25	U	9	J	25	U	25	U
1,2-Dichloropropane	25	U	25	U	25	U	10	J	25	U	25	U
cis-1,3-Dichloropropene	25	U	25	U	25	U	8	J	25	U	25	U
Trichloroethene	25	U	25	U	25	U	12	J	25	U	25	U
Dibromochloromethane	25	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane	25	U	25	U	25	U	17	J	25	U	25	U
Benzene	6	JB	62	B	5	BJ	13	JB	34	B	25	U
Trans-1,3-Dichloropropene	25	U	25	U	25	U	25	U	25	U	25	U
Bromoform	25	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone	500	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone	500	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene	25	U	25	U	25	U	6	J	25	U	25	U
1,1,2,2-Tetrachloroethane	25	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L915 Client: COE-HOT GAS Work Order: 02281012012 Page: 2b

Cust ID:	AFTOUT-VOST-R1-TP4B		AFTOUT-VOST-R1-TP5F		AFTOUT-VOST-R1-TP5B		AFTOUT-VOST-R1-TP6B		AFTOUT-VOST-BT-TP1F		AFTOUT-VOST-BT-TP1B	
RFW#:	008		009		010		012		013		014	
Toluene	5	J	31	B	4	J	12	J	15	JB	25	U
Chlorobenzene	25	U	25	U	25	U	10	J	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	7	J	25	U	25	U
Styrene	25	U	9	J	25	U	8	J	25	U	25	U
Xylene (total)	25	U	25		4	J	20	J	11	J	25	U
2-chloroethylvinylether	100	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

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Roy F. Weston, Inc. - Lionville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 14:29

RFW Batch Number: 9602L915 Client: COE-HOT GAS Work Order: 02281012012 Page: 3a

010

Sample Information												
Cust ID:	AFTOUT-VOST-R1-COND		OUT-VOST-SB-COND		VBLKRC		VBLKRC BS		VBLKRU		VBLKRV	
RFW#:	015		016		96LVX020-MB1		96LVX020-MB1		96LVQ015-MB1		96LVQ014-MB1	
Matrix:	WATER		WATER		AIR		AIR		AIR		AIR	
D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
Units:	ug/L		ug/L		total ng		total ng		total ng		total ng	
Surrogate Recovery Toluene-d8	102	%	107	%	108	%	109	%	127	%	122	%
Bromofluorobenzene	95	%	100	%	102	%	99	%	101	%	120	%
1,2-Dichloroethane-d4	91	%	96	%	105	%	107	%	98	%	115	%
		fl		fl		fl		fl		fl		fl
Chloromethane	10	U	10	U	50	U	50	U	50	U	49	J
Bromomethane	10	U	10	U	32	J	18	JB	50	U	50	U
Vinyl Chloride	10	U	10	U	50	U	50	U	50	U	50	U
Chloroethane	10	U	10	U	50	U	50	U	50	U	50	U
Methylene Chloride	5	B	3	JB	10	J	11	JB	57		29	
Acetone	40		10	U	500	U	500	U	500	U	500	U
Carbon Disulfide	5	U	5	U	25	U	25	U	25	U	25	U
1,1-Dichloroethene	5	U	5	U	25	U	93	%	25	U	25	U
1,1-Dichloroethane	5	U	5	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)	5	U	5	U	25	U	25	U	25	U	25	U
Chloroform	3	J	5		25	U	25	U	25	U	25	U
1,2-Dichloroethane	5	U	5	U	25	U	25	U	25	U	25	U
2-Butanone	10	U	10	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane	5	U	5	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride	5	U	5	U	25	U	25	U	25	U	25	U
Vinyl Acetate	10	U	10	U	100	U	100	U	100	U	100	U
Bromodichloromethane	5	U	5	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane	5	U	5	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene	5	U	5	U	25	U	25	U	25	U	25	U
Trichloroethene	5	U	5	U	25	U	106	%	25	U	25	U
Dibromochloromethane	5	U	5	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane	5	U	5	U	25	U	25	U	25	U	25	U
Benzene	5	U	5	U	6	J	102	%	11	J	9	J
Trans-1,3-Dichloropropene	5	U	5	U	25	U	25	U	25	U	25	U
Bromoform	5	U	5	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone	10	U	10	U	500	U	500	U	500	U	500	U
2-Hexanone	10	U	10	U	500	U	500	U	500	U	500	U
Tetrachloroethene	5	U	5	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane	5	U	5	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	AFTOUT-VOST-R1-COND		OUT-VOST-SB-COND		VBLKRC		VBLKRC BS		VBLKRU		VBLKRV	
RFW#:	015		016		96LVX020-MB1		96LVX020-MB1		96LVQ015-MB1		96LVQ014-MB1	
Toluene	5	U	5	U	5	J	108	%	25	U	25	U
Chlorobenzene	5	U	5	U	25	U	112	%	25	U	25	U
Ethylbenzene	5	U	5	U	25	U	25	U	25	U	25	U
Styrene	5	U	5	U	25	U	25	U	25	U	25	U
Xylene (total)	5	U	5	U	25	U	25	U	25	U	25	U
2-chloroethylvinylether	10	U	10	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

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Roy F. Weston, Inc. - Lionville Laboratory
VOST TUBE BY GC/MS

Report Date: 02/20/96 14:29

RFW Batch Number: 9602L915 Client: COE-HOT GAS Work Order: 02281012012 Page: 4a

012

		VBLKRV BS		VBLKRO		VBLKRO BS	
	Cust ID:	VBLKRV BS		VBLKRO		VBLKRO BS	
Sample Information	RFW#:	96LVQ014-MB1		96LVK031-MB1		96LVK031-MB1	
	Matrix:	AIR		WATER		WATER	
	D.F.:	1.00		1.00		1.00	
	Units:	total ng		ug/L		ug/L	
Surrogate Recovery	Toluene-d8	111	%	99	%	98	%
	Bromofluorobenzene	93	%	90	%	93	%
	1,2-Dichloroethane-d4	96	%	90	%	98	%
Chloromethane		52	B	10	U	10	U
Bromomethane		50	U	10	U	10	U
Vinyl Chloride		50	U	10	U	10	U
Chloroethane		50	U	10	U	10	U
Methylene Chloride		20	JB	2	J	4	JB
Acetone		500	U	10	U	10	U
Carbon Disulfide		25	U	5	U	5	U
1,1-Dichloroethene		108	%	5	U	114	%
1,1-Dichloroethane		25	U	5	U	5	U
1,2-Dichloroethene (trans)		25	U	5	U	5	U
Chloroform		25	U	5	U	5	U
1,2-Dichloroethane		25	U	5	U	5	U
2-Butanone		500	U	10	U	10	U
1,1,1-Trichloroethane		25	U	5	U	5	U
Carbon Tetrachloride		25	U	5	U	5	U
Vinyl Acetate		100	U	10	U	10	U
Bromodichloromethane		25	U	5	U	5	U
1,2-Dichloropropane		25	U	5	U	5	U
cis-1,3-Dichloropropene		25	U	5	U	5	U
Trichloroethene		90	%	5	U	115	%
Dibromochloromethane		25	U	5	U	5	U
1,1,2-Trichloroethane		25	U	5	U	5	U
Benzene		89	%	5	U	114	%
Trans-1,3-Dichloropropene		25	U	5	U	5	U
Bromoform		25	U	5	U	5	U
4-Methyl-2-pentanone		500	U	10	U	10	U
2-Hexanone		500	U	10	U	10	U
Tetrachloroethene		25	U	5	U	5	U
1,1,2,2-Tetrachloroethane		25	U	5	U	5	U

*= Outside of EPA CLP QC limits.

Cust ID:	VBLKRV BS		VBLKRO		VBLKRO BS	
RFW#:	96LVQ014-MB1		96LVK031-MB1		96LVK031-MB1	
Toluene	96	%	5	U	108	%
Chlorobenzene	97	%	5	U	105	%
Ethylbenzene	25	U	5	U	5	U
Styrene	25	U	5	U	5	U
Xylene (total)	25	U	5	U	5	U
2-chloroethylvinylether	100	U	10	U	10	U

*= Outside of EPA CLP QC limits.

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CASE NARRATIVE

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW # : 9602L915

W.O #: 02281-012-012-1200-00
Date Received: 02 February 1996

GC/MS VOLATILE

The set of samples consisted of two (2) water samples and seven (7) air samples collected on VOST cartridges {i.e., pairs - front (tenax) and back (tenax/charcoal)} on 31 January 1996.

The samples were analyzed according to criteria set forth in SW 846 Method 5040/8240 for Volatile Organic target compounds on 07,09,10 February 1996.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The analyses of samples AFTOUT-VOST-R1-TP2F and AFTOUT-VOST-R1-TP6F were lost due to an instrument malfunction. A copy of the Sample Discrepancy Report (SDR) has been included in Section I (Case Narrative).

2. The required holding time for analysis was met.

3. Non-target compounds were detected in these samples.

4. Three (3) of sixty-three (63) surrogate recoveries were outside QC limits.

5. All blank spike recoveries were within QC limits.

6. The method blanks contained the common contaminant Methylene Chloride at levels less than 3x the CRQL. The air method blanks also contained the target compound Benzene at levels less than the CRQL; the method blank 96LVX020-MB1 also contained the target compounds Bromomethane and Toluene at levels less than the CRQL; and the method blank 96LVQ014-MB1 also contained the target compound Chloromethane at a level less than the CRQL.

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7. All internal standard area and retention time criteria were met.

8. The calibration data has been reported using CLP Forms 6 and 7; however, VOST calibrations should not be expected to meet the calibration criteria specified on these forms.

9. The sample IDs were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters. The IDs were additionally truncated on some forms and the final character, which distinguished front from back, was deleted; in these cases, the odd RFW #s (e.g., 001, 003) represent the front(tenax) and the even RFW #s represent the back (tenax/charcoal).

Bruce O. [illegible] unit leader	2-21-96
FOR J. Michael Taylor	Date

Vice President and Laboratory Manager
Lionville Analytical Laboratory

mmz/voa/02-915v.cn

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GLOSSARY OF VOA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

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GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

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TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

MP - Missed Peak: manually added peak not found by automatic quan program.

PA - Peak Assignment: quan report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

WESTON® Sample Discrepancy Report (SDR)

SDR #: 9602C15

Initiator: Jeffrey B Smith
Date: 2/8/96
Client: COE - Hot Gas

RFW Batch: 9602L915
Samples: -003 -011
Method: SW846/MCAWW/CLP/

Parameter: MS VOA
Matrix: Air
Prep Batch:

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Transcription Error __ Client Request __ Wrong Test Code __ Sampler Error on C-O-C __ Other

b. General Discrepancy
__ Missing Sample/Extract*
__ Hold Time Exceeded
__ Improper Bottle Type
__ Container Broken*
__ Insufficient Sample*
__ Not Amenable to Analysis
__ Wrong Sample Pulled
__ Preservation Wrong
__ Label ID's Illegible
__ Received Past Hold

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date:

c. QC Problem (Include all relevant specific results; attach data if necessary)

Data results for the analyses of -003 and -011 were not obtained due to a computer/instrument malfunction during data acquisition. (acquisition terminated) 2/8/96 usk

2. Known or Probable Causes(s)

3. Discussion and Proposed Action
__ Re-log
__ Entire Batch
__ Following Samples:
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to
__ Place On/Take Off Hold (circle)

Other Description: have moved VOST analyses to another instrument and called for service

4. Project Manager Instructions...signature/date: K Baker 2/14/96
__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
X Client Contacted;
Date/Person J O'Neill 2/14/96.
__ Add
X Cancel samples 003, 011

5. Final Action...signature/date: Dawn Moore 2/20/96
__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
✓ Electronic COC Revised
__ EDD Corrections Completed

Other Explanation: these cancelled in LIMS on 2/16/96 by the MS group
SDR Recd Login 2/19/96

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator Jeff Smith	__	__ Metals: Reichner/Doughty
__	X Lab Manager: J. Michael Taylor	__	__ Inorganic: Perrone/Leonards
1	X Project Mgr: Kelly Baker	__	__ GC/LC: Jarvis/Skrzat/Schnell
__	X Section Mgr: Siery/~~Durke~~/Daniels	__	__ MS: LeMin/McIntyre/Taylor/Kasdras/Steele
__	X QA Section Mgr: Dianne Therry	__	__ Log-in: Geiger
__	X QA File: Feldman/Racioppi/Shaffer	__	__ EDD: Miller
__	X Data Reporting: Som Basuthakur	__	__ Admin: Brewer/Keehn/Edgington
__	__ Sample Prep: Osei-Mensah/Swisher	__	__ Other:

Recd 2/20

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QC SUMMARY

2A

AIR VOLATILE SURROGATE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

	EPA SAMPLE NO.	S1 (DCE)#	S2 (TOL)#	S3 (BFB)#	OTHER	TOT OUT
01	VBLKRC	105	108	102		0
02	VBLKRCMS	107	109	99		0
03	AFTOUT-VOST-R1-TP1F	109	102	112		0
04	AFTOUT-VOST-R1-TP3F	103	104	116		0
05	AFTOUT-VOST-R1-TP4F	113	109	118		0
06	AFTOUT-VOST-R1-TP5F	115	111	133		0
07	AFTOUT-VOST-BT-TP1F	102	97	114		0
08	VBLKRV	115	122	120		0
09	VBLKRVBS	96	111	93		0
10	AFTOUT-VOST-BT-TP1B	100	125	112		0
11	AFTOUT-VOST-R1-TP6B	130	137	219*		1
12	AFTOUT-VOST-R1-TP5B	112	118	189*		1
13	AFTOUT-VOST-R1-TP4B	109	106	171*		1
14	AFTOUT-VOST-R1-TP3B	99	96	130		0
15	VBLKRU	98	127	101		0
16	AFTOUT-VOST-R1-TP2B	93	87	113		0
17	AFTOUT-VOST-R1-TP1B	84	79	117		0
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
S1 (DCE)	= 1,2-Dichloroethane-d4	(50-150)
S2 (TOL)	= Toluene-d8	(50-150)
S3 (BFB)	= Bromofluorobenzene	(50-150)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II VOA-1 1/87 Rev.

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	VBLKRO	90	99	90		0
02	VBLKROMS	98	98	93		0
03	AFTOUT-VOST-R1-COND	91	102	95		0
04	OUT-VOST-SB-COND	96	107	100		0
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
S1 (DCE)	= 1,2-Dichloroethane-d4	(76-114)
S2 (TOL)	= Toluene-d8	(88-110)
S3 (BFB)	= Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM 3
AIR VOLATILE BLANK SPIKE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Matrix Spike - EPA CLP PR Sample No.: VBLKRC

COMPOUND	SPIKE ADDED (ng)	BLANK CONCENTRATION (ng)	BS CONCENTRATION (ng)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	500.00	0.0000	467.02	93	59-172
Trichloroethene	500.00	0.0000	529.47	106	62-137
Benzene	500.00	6.051	518.39	102	66-142
Toluene	500.00	5.406	545.64	108	59-139
Chlorobenzene	500.00	0.0000	562.25	112	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: ____________________

FORM III VOA

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Matrix Spike - EPA CLP PR Sample No.: VBLKRO

COMPOUND	SPIKE ADDED (UG/L)	BLANK CONCENTRATION (UG/L)	BS CONCENTRATION (UG/L)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	56.757	114	61-145
Trichloroethene	50.000	0.0000	57.350	115	71-120
Benzene	50.000	0.0000	56.933	114	76-127
Toluene	50.000	0.0000	54.030	108	76-125
Chlorobenzene	50.000	0.0000	52.673	105	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: ______________________

FORM 3
AIR VOLATILE BLANK SPIKE RECOVERY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Matrix Spike - EPA CLP PR Sample No.: VBLKRV

COMPOUND	SPIKE ADDED (ng)	BLANK CONCENTRATION (ng)	BS CONCENTRATION (ng)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	500.00	0.0000	542.13	108	59-172
Trichloroethene	500.00	0.0000	448.31	90	62-137
Benzene	500.00	8.970	453.79	89	66-142
Toluene	500.00	0.0000	478.36	96	59-139
Chlorobenzene	500.00	0.0000	486.63	97	60-133

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: ______________________________

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Lab File ID: X2709   Lab Sample ID: 96LVX020-MB1

Date Analyzed: 02/07/96   Time Analyzed: 1212

Matrix: (soil/water) AIR   Level:(low/med) ______

Instrument ID: 5970X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VBLKRCMS	96LVX020-MB1S	X2710	1259
02	AFTOUT-VOST-R1-TP1	9602L915-001	X2712	1410
03	AFTOUT-VOST-R1-TP3	9602L915-005	X2715	1602
04	AFTOUT-VOST-R1-TP4	9602L915-007	X2716	1636
05	AFTOUT-VOST-R1-TP5	9602L915-009	X2717	1708
06	AFTOUT-VOST-BT-TP1	9602L915-013	X2719	1821
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COMMENTS: ______

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: K2905 Lab Sample ID: 96LVK031-MB1

Date Analyzed: 02/09/96 Time Analyzed: 1449

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: 5970K

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VBLKROMS	96LVK031-MB1S	K2906	1532
02	AFTOUT-VOST-R1-COND	9602L915-015	K2907	1616
03	OUT-VOST-SB-COND	9602L915-016	K2908	1650
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COMMENTS:

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VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: Q021005 Lab Sample ID: 96LVQ015-MB1

Date Analyzed: 02/10/96 Time Analyzed: 1621

Matrix: (soil/water) AIR Level:(low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	AFTOUT-VOST-R1-TP2	9602L915-004	Q021006	1725
02	AFTOUT-VOST-R1-TP1	9602L915-002	Q021007	1815
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COMMENTS: ______

FORM IV VOA 1/87 Rev.

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: Q020904 Lab Sample ID: 96LVQ014-MB1

Date Analyzed: 02/09/96 Time Analyzed: 1137

Matrix: (soil/water) AIR Level:(low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VBLKRVBS	96LVQ014-MB1S	Q020906	1327
02	AFTOUT-VOST-BT-TP1	9602L915-014	Q020909	1532
03	AFTOUT-VOST-R1-TP6	9602L915-012	Q020910	1609
04	AFTOUT-VOST-R1-TP5	9602L915-010	Q020911	1652
05	AFTOUT-VOST-R1-TP4	9602L915-008	Q020913	1809
06	AFTOUT-VOST-R1-TP3	9602L915-006	Q020915	1923
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COMMENTS: ______

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Lab File ID: K2404   BFB Injection Date: 02/04/96

Instrument ID: 5970K   BFB Injection Time: 1107

Matrix:(soil/water) WATER   Level:(low/med) LOW   Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.9
75	30.0 - 60.0% of mass 95	50.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	80.0
175	5.0 - 9.0% of mass 174	6.3 (7.9)1
176	95.0 - 100.9% of mass 174	79.7 (99.6)1
177	5.0 - 9.0% of mass 176	4.8 (6.0)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD200	VSTD200	K2405	02/04/96	1122
02	VSTD100	VSTD100	K2406	02/04/96	1158
03	VSTD020	VSTD020	K2407	02/04/96	1233
04	VSTD010	VSTD010	K2408	02/04/96	1307
05	VSTD050	VSTD050	K2409	02/04/96	1347
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VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Lab File ID: K2901   BFB Injection Date: 02/09/96

Instrument ID: 5970K   BFB Injection Time: 1217

Matrix:(soil/water) WATER   Level:(low/med) LOW   Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.7
75	30.0 - 60.0% of mass 95	50.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	86.2
175	5.0 - 9.0% of mass 174	6.7 (7.8)1
176	95.0 - 100.9% of mass 174	83.5 (96.8)1
177	5.0 - 9.0% of mass 176	5.4 (6.5)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	K2903	02/09/96	1310
02	VBLKRO	96LVK031-MB1	K2905	02/09/96	1449
03	VBLKROMS	96LVK031-MB1S	K2906	02/09/96	1532
04	AFTOUT-VOST-R1-COND	9602L915-015	K2907	02/09/96	1616
05	OUT-VOST-SB-COND	9602L915-016	K2908	02/09/96	1650
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VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: X2701 BFB Injection Date: 02/07/96

Instrument ID: 5970X BFB Injection Time: 0713

Matrix:(soil/water) AIR Level:(low/med) ____ Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.5
75	30.0 - 60.0% of mass 95	46.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	72.7
175	5.0 - 9.0% of mass 174	5.0 (6.9)1
176	95.0 - 100.9% of mass 174	69.8 (96.0)1
177	5.0 - 9.0% of mass 176	4.6 (6.7)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD100	VSTD100	X2702	02/07/96	0737
02	VSTD1000	VSTD1000	X2704	02/07/96	0844
03	VSTD2000	VSTD2000	X2705	02/07/96	0915
04	VSTD500	VSTD500	X2707	02/07/96	1033
05	VBLKRC	96LVX020-MB1	X2709	02/07/96	1212
06	VBLKRCMS	96LVX020-MB1S	X2710	02/07/96	1259
07	AFTOUT-VOST-R1-TP1	9602L915-001	X2712	02/07/96	1410
08	AFTOUT-VOST-R1-TP3	9602L915-005	X2715	02/07/96	1602
09	AFTOUT-VOST-R1-TP4	9602L915-007	X2716	02/07/96	1636
10	AFTOUT-VOST-R1-TP5	9602L915-009	X2717	02/07/96	1708
11	AFTOUT-VOST-BT-TP1	9602L915-013	X2719	02/07/96	1821
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VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: Q020801 BFB Injection Date: 02/08/96

Instrument ID: 1050Q BFB Injection Time: 1357

Matrix:(soil/water) AIR Level:(low/med) ___ Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.4
75	30.0 - 60.0% of mass 95	39.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	90.7
175	5.0 - 9.0% of mass 174	6.6 (7.3)1
176	95.0 - 100.9% of mass 174	90.5 (99.8)1
177	5.0 - 9.0% of mass 176	7.1 (7.9)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q020803	02/08/96	1518
02	VSTD1000	VSTD1000	Q020804	02/08/96	1600
03	VSTD2000	VSTD2000	Q020805	02/08/96	1636
04	VSTD100	VSTD100	Q020807	02/08/96	1749
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VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID: Q020901 BFB Injection Date: 02/09/96

Instrument ID: 1050Q BFB Injection Time: 0926

Matrix:(soil/water) AIR Level:(low/med) ____ Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.9
75	30.0 - 60.0% of mass 95	46.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	55.9
175	5.0 - 9.0% of mass 174	4.3 (7.7)1
176	95.0 - 100.9% of mass 174	56.4 (100.9)1
177	5.0 - 9.0% of mass 176	4.2 (7.5)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q020902	02/09/96	1008
02	VBLKRV	96LVQ014-MB1	Q020904	02/09/96	1137
03	VBLKRVBS	96LVQ014-MB1S	Q020906	02/09/96	1327
04	AFTOUT-VOST-BT-TP1	9602L915-014	Q020909	02/09/96	1532
05	AFTOUT-VOST-R1-TP6	9602L915-012	Q020910	02/09/96	1609
06	AFTOUT-VOST-R1-TP5	9602L915-010	Q020911	02/09/96	1652
07	AFTOUT-VOST-R1-TP4	9602L915-008	Q020913	02/09/96	1809
08	AFTOUT-VOST-R1-TP3	9602L915-006	Q020915	02/09/96	1923
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VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Lab File ID: Q021001   BFB Injection Date: 02/10/96

Instrument ID: 1050Q   BFB Injection Time: 1225

Matrix:(soil/water) AIR   Level:(low/med) ___   Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.3
75	30.0 - 60.0% of mass 95	46.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	57.3
175	5.0 - 9.0% of mass 174	3.9 (6.7)1
176	95.0 - 100.9% of mass 174	57.7 (100.6)1
177	5.0 - 9.0% of mass 176	4.0 (7.0)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q021003	02/10/96	1440
02	VBLKRU	96LVQ015-MB1	Q021005	02/10/96	1621
03	AFTOUT-VOST-R1-TP2	9602L915-004	Q021006	02/10/96	1725
04	AFTOUT-VOST-R1-TP1	9602L915-002	Q021007	02/10/96	1815
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8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID (Standard): K2903 Date Analyzed: 02/09/96

Instrument ID: 5970K Time Analyzed: 1310

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	33265	7.37	117090	10.04	95025	16.73
	UPPER LIMIT	66530	7.87	234180	10.54	190050	17.23
	LOWER LIMIT	16632	6.87	58545	9.54	47512	16.23
	EPA SAMPLE NO.						
01	VBLKRO	31488	7.40	111067	10.06	90926	16.77
02	VBLKROMS	28385	7.41	97920	10.08	82571	16.79
03	AFTOUT-VOST-R1-COND	25524	7.44	95998	10.08	76679	16.79
04	OUT-VOST-SB-COND	23370	7.41	87850	10.08	70644	16.79
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

FORM VIII VOA 1/87 Rev.

8A
VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON　　Contract: 02281-012-012-1200

Lab Code:　　Case No.:　　SAS No.:　　SDG No.: 9602L915

Lab File ID (Standard): X2707　　Date Analyzed: 02/07/96

Instrument ID: 5970X　　Time Analyzed: 1033

Matrix:(soil/water) AIR　　Level:(low/med) LOW　　Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	50907	6.49	229903	9.71	158570	16.73
	UPPER LIMIT	101814	6.99	459806	10.21	317140	17.23
	LOWER LIMIT	25454	5.99	114952	9.21	79285	16.23
	EPA SAMPLE NO.						
01	VBLKRC	49633	6.49	224705	9.71	159497	16.74
02	VBLKRCMS	54578	6.52	242276	9.72	164922	16.76
03	AFTOUT-VOST-R1-TP1F	51148	6.51	226549	9.71	169568	16.74
04	AFTOUT-VOST-R1-TP3F	47541	6.51	227198	9.73	170033	16.74
05	AFTOUT-VOST-R1-TP4F	44020	6.54	207511	9.73	157007	16.74
06	AFTOUT-VOST-R1-TP5F	47590	6.53	220497	9.73	163059	16.74
07	AFTOUT-VOST-BT-TP1F	46484	6.51	212311	9.71	156428	16.74
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

FORM VIII VOA　　1/87 Rev.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-1200

Lab Code: Case No.: SAS No.: SDG No.: 9602L915

Lab File ID (Standard): Q020902 Date Analyzed: 02/09/96

Instrument ID: 1050Q Time Analyzed: 1008

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	59254	13.40	403179	15.13	416696	19.37
	UPPER LIMIT	118508	13.90	806358	15.63	833392	19.87
	LOWER LIMIT	29627	12.90	201590	14.63	208348	18.87
	EPA SAMPLE NO.						
01	VBLKRV	56720	13.40	368186	15.15	350052	19.37
02	VBLKRVBS	63170	13.40	446666	15.13	400407	19.35
03	AFTOUT-VOST-BT-TP1B	46159	13.42	294822	15.15	243815	19.37
04	AFTOUT-VOST-R1-TP6B	51443	13.40	302502	15.13	290415	19.35
05	AFTOUT-VOST-R1-TP5B	57259	13.42	352087	15.15	363685	19.37
06	AFTOUT-VOST-R1-TP4B	73571	13.40	426203	15.15	427238	19.37
07	AFTOUT-VOST-R1-TP3B	61240	13.40	367892	15.15	377200	19.3[illegible]
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

FORM VIII VOA 1/87 Rev.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-1200

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L915

Lab File ID (Standard): Q021003   Date Analyzed: 02/10/96

Instrument ID: 1050Q   Time Analyzed: 1440

Matrix:(soil/water) AIR   Level:(low/med) LOW   Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	64073	13.40	388304	15.15	408945	19.37
	UPPER LIMIT	128146	13.90	776608	15.65	817890	19.87
	LOWER LIMIT	32036	12.90	194152	14.65	204472	18.87
	EPA SAMPLE NO.						
01	VBLKRU	54534	13.40	329131	15.13	280207	19.35
02	AFTOUT-VOST-R1-TP2B	73067	13.40	390192	15.13	410245	19.35
03	AFTOUT-VOST-R1-TP1B	75545	13.42	431539	15.15	469286	19.37
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE PREP RECORD

Sheet no.: 1

Extract. Date: 02/07/96 Extraction Batch No: 96LVX020 Analyst: JS Method: N/A

Test: OVOS Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/20/96 Solvent: Adsorbent:

968

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L915-	COE-HOT GAS										
001 T	AFTOUT-VOST-R1-TP1F			1.0		1		1.0	N	0.00	1.0
005 T	AFTOUT-VOST-R1-TP3F			1.0		1		1.0	N	0.00	1.0
007 T	AFTOUT-VOST-R1-TP4F			1.0		1		1.0	N	0.00	1.0
009 T	AFTOUT-VOST-R1-TP5F			1.0		1		1.0	N	0.00	1.0
013 T	AFTOUT-VOST-BT-TP1F			1.0		1		1.0	N	0.00	1.0
96LVX020-MB1 T	VBLKRC			1.0		1		1.0	N	0.00	1.0
96LVX020-MB1 TS	VBLKRC			1.0	1.0	1		1.0	N	0.00	1.0

Comments:
Surrogate:
Spike:

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE PREP RECORD

Sheet no.: 1

Extract. Date: 02/10/96 Extraction Batch No: 96LVQ015 Analyst: VR Method: N/A

Test: OVOS Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/20/96 Solvent: Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L915-	COE-HOT GAS										
002 T	AFTOUT-VOST-R1-TP1B			1.0		1		1.0	N	0.00	1.0
004 T	AFTOUT-VOST-R1-TP2B			1.0		1		1.0	N	0.00	1.0
9602L953-	COE-HOT GAS										
002 T	AFTOUT-VOST-R2-TP1B			1.0		1		1.0	N		1.0
004 T	AFTOUT-VOST-R2-TP2B			1.0		1		1.0	N		1.0
006 T	AFTOUT-VOST-R2-TP3B			1.0		1		1.0	N		1.0
008 T	AFTOUT-VOST-R2-TP4B			1.0		1		1.0	N		1.0
96LVQ015-MB1 T	VBLKRU			1.0		1		1.0	N	0.00	1.0

Comments:
Surrogate:
Spike:

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE PREP RECORD

Sheet no.: 1

Extract. Date: 02/09/96 Extraction Batch No: 96LVQ014 Analyst: VR Method: N/A

Test: OVOS Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/20/96 Solvent: Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L915-	COE-HOT GAS										
006 T	AFTOUT-VOST-R1-TP3B			1.0		1		1.0	N	0.00	1.0
008 T	AFTOUT-VOST-R1-TP4B			1.0		1		1.0	N	0.00	1.0
010 T	AFTOUT-VOST-R1-TP5B			1.0		1		1.0	N	0.00	1.0
012 T	AFTOUT-VOST-R1-TP6B			1.0		1		1.0	N	0.00	1.0
014 T	AFTOUT-VOST-BT-TP1B			1.0		1		1.0	N	0.00	1.0
96LVQ014-MB1 T	VBLKRV			1.0		1		1.0	N	0.00	1.0
96LVQ014-MB1 TS	VBLKRV			1.0	1.0	1		1.0	N	0.00	1.0

Comments:
Surrogate:
Spike:

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

020

Roy F. Weston, Inc. Lionville, Lab.

SAMPLE PREP RECORD

Sheet no.: 1

Extract. Date: 02/09/96 Extraction Batch No: 96LVK031 Analyst: PS Method: N/A

Test: OVOS Cleanup Date: Analyst: Client: COE-HOT GAS

LIMS Report Date: 02/20/96 Solvent: Adsorbent:

Sample No:	Client Name / Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9602L915-	COE-HOT GAS										
015 T	AFTOUT-VOST-R1-COND	2	5	1.0		5		1.0	N	0.0	1.0
016 T	OUT-VOST-SB-COND	2	5	1.0		5		1.0	N	0.0	1.0
9602L953-	COE-HOT GAS										
013 T	AFTOUT-VOST-R2-COND	7	5	1.0		5		1.0	N	0.0	1.0
028 T	AFTOUT-VOST-R3-COND	7	5	1.0		5		1.0	N	0.0	1.0
96LVK031-MB1 T	VBLKRO	7	5	1.0		5		1.0	N	0.0	1.0
96LVK031-MB1 TS	VBLKRO	7	5	1.0	1.0	5		1.0	N	0.0	1.0

Comments:
Surrogate:
Spike:

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer

END OF DATA PACKAGE

Roy F. Weston, Inc. - Lionville Laboratory
VOST ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/07/96 RFW LOT # :9602L953

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
AFTOUT-VOST-R2-TP1F	001	AI	96LVQ018	02/02/96	N/A	02/12/96
AFTOUT-VOST-R2-TP1B	002	AI	96LVQ015	02/02/96	N/A	02/10/96
AFTOUT-VOST-R2-TP2F	003	AI	96LVQ018	02/02/96	N/A	02/12/96
AFTOUT-VOST-R2-TP2B	004	AI	96LVQ015	02/02/96	N/A	02/10/96
AFTOUT-VOST-R2-TP3F	005	AI	96LVQ018	02/02/96	N/A	02/12/96
AFTOUT-VOST-R2-TP3B	006	AI	96LVQ015	02/02/96	N/A	02/10/96
AFTOUT-VOST-R2-TP4F	007	AI	96LVQ018	02/02/96	N/A	02/12/96
AFTOUT-VOST-R2-TP4B	008	AI	96LVQ015	02/02/96	N/A	02/10/96
AFTOUT-VOST-R2-TP5F	009	AI	96LVQ018	02/02/96	N/A	02/13/96
AFTOUT-VOST-R2-TP5B	010	AI	96LVQ017	02/02/96	N/A	02/11/96
AFTOUT-VOST-R2-TP6F	011	AI	96LVQ018	02/02/96	N/A	02/13/96
AFTOUT-VOST-R2-TP6B	012	AI	96LVQ017	02/02/96	N/A	02/11/96
AFTOUT-VOST-R2-COND	013	W	96LVK031	02/02/96	N/A	02/09/96
AFTOUT-VOST-SB-TP1F	014	AI	96LVQ018	02/02/96	N/A	02/13/96
AFTOUT-VOST-SB-TP1B	015	AI	96LVQ017	02/02/96	N/A	02/11/96
AFTOUT-VOST-R3-TP1F	016	AI	96LVQ018	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP1B	017	AI	96LVQ017	02/04/96	N/A	02/11/96
AFTOUT-VOST-R3-TP2F	018	AI	96LVQ019	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP2B	019	AI	96LVQ017	02/04/96	N/A	02/11/96
AFTOUT-VOST-R3-TP3F	020	AI	96LVQ019	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP3B	021	AI	96LVQ017	02/04/96	N/A	02/11/96
AFTOUT-VOST-R3-TP4F	022	AI	96LVQ019	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP4B	023	AI	96LVQ017	02/04/96	N/A	02/11/96
AFTOUT-VOST-R3-TP5F	024	AI	96LVQ019	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP5B	025	AI	96LVQ017	02/04/96	N/A	02/11/96
AFTOUT-VOST-R3-TP6F	026	AI	96LVQ019	02/04/96	N/A	02/13/96
AFTOUT-VOST-R3-TP6B	027	AI	96LVQ017	02/04/96	N/A	02/12/96
AFTOUT-VOST-R3-COND	028	W	96LVK031	02/04/96	N/A	02/09/96

LAB QC:

VBLKRY	MB1	AI	96LVQ018	N/A	N/A	02/12/96
VBLKRU	MB1	AI	96LVQ015	N/A	N/A	02/10/96
VBLKRX	MB1	AI	96LVQ017	N/A	N/A	02/11/96
VBLKRO	MB1	W	96LVK031	N/A	N/A	02/09/96
VBLKRO	MB1 BS	W	96LVK031	N/A	N/A	02/09/96
VBLKSE	MB1	AI	96LVQ019	N/A	N/A	02/13/96

TABLE OF CONTENTS

CHAIN OF CUSTODY

WESTON Analytics Use Only

9602L953

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 2

Client COE - HOT GAS

Est. Final Proj. Sampling Date

Work Order # 02281-012-012-9999-00

Project Contact/Phone # Jeff Ungvari

AD Project Manager CLP Polly Baker

QC STD Del 2/27/96 TAT OSD 24 Hours

Date Rec'd 2/7/96 Date Due 2/9/96

Account # COEHOTGAS 2/7/96

Refrigerator #		
#/Type Container	Liquid	
	Solid	Tubes
Volume	Liquid	40
	Solid	
Preservatives		

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB; INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Volatile Organics 5040		0V05T 5040			WESTON Analytics Use Only
001/002	COE-HG-AFTBT-VOST-R2-TP1			Air	2/2/96				X						(#05609)
003/004	COE-HG-AFTBT-VOST-R2-TP2								X						(#0350?)
005/006	COE-HG-AFTBT-VOST-R2-TP3								X						(#05503)
007/008	COE-HG-AFTBT-VOST-R2-TP4								X						(#05610)
009/010	COE-HG-AFTBT-VOST-R2-TP5								X						(#05611)
011/012	COE-HG-AFTBT-VOST-R2-TP6								X						(#05612)
013	COE-HG-AFTBT-VOST-R2-COND			H2O								X			
014/015	COE-HG-AFTBT-VOST-SB-TP1			Air					X						(#05502)
	~~COE-HG-AFTBT-VOST-TB-COND~~			H2O								X			

Rec'd broken. 2/7/96

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

Analyze Tenax — Tenax/Charcoal separately

SW Method 5040/8240

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]				[signature]	[signature]	2-7-96	9:30

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 3028777 5814
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# N/A Cooler# N/A 381-596a

WESTON Analytics Use Only
9602L953

Custody Transfer Record/Lab Work Request

WESTON

Page 2 of 2

Client OC - HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-1200
Project Contact/Phone # Jeff oneill
AD Project Manager
QC STD Del STD TAT STD
Date Rec'd
Account #

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →
ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC-Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Volatile Organics 5040	8040	WESTON Analytics Use Only
016	OE-H6-AFMT-WST-R3-TP1			Air	2/4/96		X		#05605
018/19	OE-H6-AFMT-WST-R3-TP2						X		#05505
020	OE-H6-AFMT-WST-R3-TP3						X		#05601
022	OE-H6-AFMT-WST-R3-TP4						X		#05602
024	OE-H6-AFMT-WST-R3-TP5						X		#05604
026	OE-H6-AFMT-WST-R3-TP6						X		#05608
028	OE-H6-AFMT-WST-R3-Cond			H2O				X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Analyze Tenax - Tenax/Charcoal separately
SW method 5040-8040

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[illegible signature]				Fred K	[signature]	2-7-96	9:30

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec'd Y or N

RFW 21 21-001/A 7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381-596a

DATA SUMMARY

Roy F. Weston, Inc. - [illegible]onville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 1a

007

	Cust ID:	AFTOUT-VOST-R2-TP1F		AFTOUT-VOST-R2-TP1B		AFTOUT-VOST-R2-TP2F		AFTOUT-VOST-R2-TP2B		AFTOUT-VOST-R2-TP3F		AFTOUT-VOST-R2-TP3B	
Sample	RFW#:	001		002		003		004		005		006	
Information	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	total ng		total ng		total ng		total ng		total ng		total ng	
	Toluene-d8	90	%	92	%	106	%	84	%	88	%	90	%
Surrogate	Bromofluorobenzene	124	%	99	%	113	%	113	%	102	%	114	%
Recovery	1,2-Dichloroethane-d4	93	%	93	%	65	%	78	%	70	%	92	%
			fl		fl		fl		fl		fl		fl
Chloromethane		50	U	260		50	U	2000	E	50	U	760	
Bromomethane		50	U	68		50	U	180		50	U	93	
Vinyl Chloride		50	U	50	U	50	U	50	U	50	U	50	U
Chloroethane		50	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride		25	B	14	JB	47	B	16	JB	32	B	49	B
Acetone		1800		1500		7300		1800		2200		240	J
Carbon Disulfide		8	J	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)		25	U	25	U	25	U	25	U	25	U	25	U
Chloroform		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
2-Butanone		500	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride		25	U	25	U	25	U	25	U	25	U	25	U
Vinyl Acetate		100	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane		25	U	25	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Trichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
Dibromochloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Benzene		16	JB	8	JB	12	JB	5	JB	5	JB	5	JB
Trans-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Bromoform		25	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone		500	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone		500	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane		25	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

Cust ID:	AFTOUT-VOST-R2-TP1F		AFTOUT-VOST-R2-TP1B		AFTOUT-VOST-R2-TP2F		AFTOUT-VOST-R2-TP2B		AFTOUT-VOST-R2-TP3F		AFTOUT-VOST-R2-TP3B	
RFW#:	001		002		003		004		005		006	
Toluene	10	J	25	U	12	J	25	U	5	J	25	U
Chlorobenzene	25	U	25	U	25	U	25	U	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	25	U	25	U	25	U
Styrene	25	U	25	U	25	U	25	U	25	U	25	U
Xylene (total)	6	J	25	U	5	J	25	U	25	U	25	U
2-chloroethylvinylether	100	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory
VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953   Client: COE-HOT GAS   Work Order: 02281012012 Page: 2a

	Cust ID:	AFTOUT-VOST-R2-TP4F	fl	AFTOUT-VOST-R2-TP4B	fl	AFTOUT-VOST-R2-TP5F	fl	AFTOUT-VOST-R2-TP5B	fl	AFTOUT-VOST-R2-TP6F	fl	AFTOUT-VOST-R2-TP6B	fl
Sample Information	RFW#:	007		008		009		010		011		012	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	total ng		total ng		total ng		total ng		total ng		total ng	
	Toluene-d8	99	%	85	%	97	%	106	%	102	%	81	%
Surrogate	Bromofluorobenzene	133	%	125	%	130	%	129	%	113	%	118	%
Recovery	1,2-Dichloroethane-d4	95	%	90	%	82	%	105	%	68	%	88	%
Chloromethane		50	U	390		50	U	360		50	U	690	
Bromomethane		50	U	85		50	U	73		50	U	150	
Vinyl Chloride		50	U	50	U	50	U	50	U	50	U	50	U
Chloroethane		50	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride		23	JB	54	B	21	JB	29	B	33	B	29	B
Acetone		3000		370	J	3100		500	U	3300		500	U
Carbon Disulfide		7	J	25	U	9	J	25	U	10	J	25	U
1,1-Dichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)		25	U	25	U	25	U	25	U	25	U	25	U
Chloroform		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
2-Butanone		500	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride		25	U	25	U	25	U	25	U	25	U	25	U
Vinyl Acetate		100	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane		25	U	25	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Trichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
Dibromochloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Benzene		24	JB	6	JB	9	JB	9	JB	9	JB	11	JB
Trans-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Bromoform		25	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone		500	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone		500	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane		25	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 2b

Cust ID:	AFTOUT-VOST-R2-TP4F		AFTOUT-VOST-R2-TP4B		AFTOUT-VOST-R2-TP5F		AFTOUT-VOST-R2-TP5B		AFTOUT-VOST-R2-TP6F		AFTOUT-VOST-R2-TP6B	
RFW#:	007		008		009		010		011		012	
Toluene	14	J	25	U	7	J	25	U	7	J	25	U
Chlorobenzene	25	U	25	U	25	U	25	U	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	25	U	25	U	25	U
Styrene	5	J	25	U	25	U	25	U	25	U	25	U
Xylene (total)	8	J	25	U	25	U	25	U	25	U	25	U
2-chloroethylvinylether	100	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 3a

Sample Information	Cust ID:	AFTOUT-VOST-R2-COND		AFTOUT-VOST-SB-TP1F		AFTOUT-VOST-SB-TP1B		AFTOUT-VOST-R3-TP1F		AFTOUT-VOST-R3-TP1B		AFTOUT-VOST-R3-TP2F	
	RFW#:	013		014		015		016		017		018	
	Matrix:	WATER		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/L		total ng		total ng		total ng		total ng		total ng	
	Toluene-d8	102	%	90	%	110	%	115	%	94	%	96	%
Surrogate	Bromofluorobenzene	98	%	124	%	101	%	113	%	137	%	109	%
Recovery	1,2-Dichloroethane-d4	96	%	83	%	96	%	86	%	106	%	108	%
			fl		fl		fl		fl		fl		fl
Chloromethane		10	U	50	U	510		20	J	500		61	
Bromomethane		10	U	5	JB	130		26	JB	110		140	B
Vinyl Chloride		10	U	50	U	50	U	50	U	50	U	50	U
Chloroethane		10	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride		2	JB	29	B	44	B	43	B	57	B	28	B
Acetone		32		1700		500	U	1300		840		620	
Carbon Disulfide		5	U	25	U	25	U	11	J	25	U	13	J
1,1-Dichloroethene		5	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane		5	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)		5	U	25	U	25	U	25	U	25	U	25	U
Chloroform		3	J	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethane		5	U	25	U	25	U	25	U	25	U	25	U
2-Butanone		10	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane		5	U	25	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride		5	U	25	U	25	U	25	U	25	U	25	U
Vinyl Acetate		10	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane		5	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane		5	U	25	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene		5	U	25	U	25	U	25	U	25	U	25	U
Trichloroethene		5	U	25	U	25	U	25	U	25	U	25	U
Dibromochloromethane		5	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane		5	U	25	U	25	U	25	U	25	U	25	U
Benzene		5	U	6	JB	25	U	18	JB	10	JB	51	
Trans-1,3-Dichloropropene		5	U	25	U	25	U	25	U	25	U	25	U
Bromoform		5	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone		10	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone		10	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene		5	U	25	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane		5	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

010

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 3b

Cust ID:	AFTOUT-VOST-R2-COND		AFTOUT-VOST-SB-TP1F		AFTOUT-VOST-SB-TP1B		AFTOUT-VOST-R3-TP1F		AFTOUT-VOST-R3-TP1B		AFTOUT-VOST-R3-TP2F	
RFW#:	013		014		015		016		017		018	
Toluene	5	U	25	U	25	U	11	J	25	U	25	
Chlorobenzene	5	U	25	U	25	U	25	U	25	U	25	U
Ethylbenzene	5	U	25	U	25	U	25	U	25	U	25	U
Styrene	5	U	25	U	25	U	25	U	25	U	12	J
Xylene (total)	5	U	25	U	25	U	6	J	4	J	9	J
2-chloroethylvinylether	10	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

010

Roy F. Weston, Inc. - Lionville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 4a

Sample Information	Cust ID:	AFTOUT-VOST-R3-TP2B		AFTOUT-VOST-R3-TP3F		AFTOUT-VOST-R3-TP3B		AFTOUT-VOST-R3-TP4F		AFTOUT-VOST-R3-TP4B		AFTOUT-VOST-R3-TP5F	
	RFW#:	019		020		021		022		023		024	
	Matrix:	AIR		AIR		AIR		AIR		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	total ng		total ng		total ng		total ng		total ng		total ng	
	Toluene-d8	104	%	95	%	101	%	114	%	107	%	84	%
Surrogate	Bromofluorobenzene	179 *	%	140	%	165 *	%	160 *	%	190 *	%	98	%
Recovery	1,2-Dichloroethane-d4	117	%	124	%	108	%	102	%	121	%	80	%
			fl		fl		fl		fl		fl		fl
Chloromethane		370		50	U	730		50	U	330		50	U
Bromomethane		97		50	U	78		50	U	87		50	U
Vinyl Chloride		50	U	50	U	50	U	50	U	50	U	50	U
Chloroethane		50	U	50	U	50	U	50	U	50	U	50	U
Methylene Chloride		22	JB	15	JB	23	JB	13	JB	25	B	22	JB
Acetone		1300		560		440	J	2100		450	J	1600	
Carbon Disulfide		25	U	7	J	25	U	7	J	25	U	25	U
1,1-Dichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethene (trans)		25	U	25	U	25	U	25	U	25	U	25	U
Chloroform		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
2-Butanone		500	U	500	U	500	U	500	U	500	U	500	U
1,1,1-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Carbon Tetrachloride		25	U	25	U	25	U	25	U	25	U	25	U
Vinyl Acetate		100	U	100	U	100	U	100	U	100	U	100	U
Bromodichloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,2-Dichloropropane		25	U	25	U	25	U	25	U	25	U	25	U
cis-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Trichloroethene		25	U	25	U	25	U	25	U	25	U	25	U
Dibromochloromethane		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2-Trichloroethane		25	U	25	U	25	U	25	U	25	U	25	U
Benzene		10	JB	15	J	8	JB	13	J	12	JB	7	J
Trans-1,3-Dichloropropene		25	U	25	U	25	U	25	U	25	U	25	U
Bromoform		25	U	25	U	25	U	25	U	25	U	25	U
4-Methyl-2-pentanone		500	U	500	U	500	U	500	U	500	U	500	U
2-Hexanone		500	U	500	U	500	U	500	U	500	U	500	U
Tetrachloroethene		25	U	25	U	25	U	25	U	25	U	25	U
1,1,2,2-Tetrachloroethane		25	U	25	U	25	U	25	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 4b

Cust ID:	AFTOUT-VOST-R3-TP2B		AFTOUT-VOST-R3-TP3F		AFTOUT-VOST-R3-TP3B		AFTOUT-VOST-R3-TP4F		AFTOUT-VOST-R3-TP4B		AFTOUT-VOST-R3-TP5F	
RFW#:	019		020		021		022		023		024	
Toluene	25	U	10	J	25	U	8	J	25	U	7	J
Chlorobenzene	25	U	25	U	25	U	25	U	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	25	U	25	U	25	U
Styrene	25	U	25	U	25	U	25	U	25	U	25	U
Xylene (total)	25	U	25	U	25	U	25	U	3	J	25	U
2-chloroethylvinylether	100	U	100	U	100	U	100	U	100	U	100	U

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - [illegible]nville Laboratory
VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 5a

Sample Information		AFTOUT-VOST-R3-TP5B	fl	AFTOUT-VOST-R3-TP6F	fl	AFTOUT-VOST-R3-TP6B	fl	AFTOUT-VOST-R3-COND	fl	VBLKRY	fl	VBLKRU	fl
	RFW#:	025		026		027		028		96LVQ018-MB1		96LVQ015-MB1	
	Matrix:	AIR		AIR		AIR		WATER		AIR		AIR	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	total ng		total ng		total ng		ug/L		total ng		total ng	
	Toluene-d8	116	%	96	%	111	%	100	%	147	%	127	%
Surrogate	Bromofluorobenzene	179 *	%	125	%	179 *	%	96	%	113	%	101	%
Recovery	1,2-Dichloroethane-d4	111	%	92	%	116	%	98	%	.106	%	98	%
Chloromethane		4600	E	50	U	2500	E	10	U	50	U	50	U
Bromomethane		260		50	U	360		10	U	25	J	50	U
Vinyl Chloride		50	U	50	U	50	U	10	U	50	U	50	U
Chloroethane		50	U	50	U	50	U	10	U	50	U	50	U
Methylene Chloride		52	B	22	JB	31	B	6	B	19	J	57	
Acetone		500	U	930		500	U	88		500	U	500	U
Carbon Disulfide		25	U	6	J	25	U	5	U	25	U	25	U
1,1-Dichloroethene		25	U	25	U	25	U	5	U	25	U	25	U
1,1-Dichloroethane		25	U	25	U	25	U	5	U	25	U	25	U
1,2-Dichloroethene (trans)		25	U	25	U	25	U	5	U	25	U	25	U
Chloroform		25	U	25	U	25	U	2	J	25	U	25	U
1,2-Dichloroethane		25	U	25	U	25	U	5	U	25	U	25	U
2-Butanone		500	U	500	U	500	U	10	U	500	U	500	U
1,1,1-Trichloroethane		25	U	25	U	25	U	5	U	25	U	25	U
Carbon Tetrachloride		25	U	25	U	25	U	5	U	25	U	25	U
Vinyl Acetate		100	U	100	U	100	U	10	U	100	U	100	U
Bromodichloromethane		25	U	25	U	25	U	5	U	25	U	25	U
1,2-Dichloropropane		25	U	25	U	25	U	5	U	25	U	25	U
cis-1,3-Dichloropropene		25	U	25	U	25	U	5	U	25	U	25	U
Trichloroethene		25	U	25	U	25	U	5	U	25	U	25	U
Dibromochloromethane		25	U	25	U	25	U	5	U	25	U	25	U
1,1,2-Trichloroethane		25	U	25	U	25	U	5	U	25	U	25	U
Benzene		12	JB	6	J	12	JB	5	U	4	J	11	J
Trans-1,3-Dichloropropene		25	U	25	U	25	U	5	U	25	U	25	U
Bromoform		25	U	25	U	25	U	5	U	25	U	25	U
4-Methyl-2-pentanone		500	U	500	U	500	U	10	U	500	U	500	U
2-Hexanone		500	U	500	U	500	U	10	U	500	U	500	U
Tetrachloroethene		25	U	25	U	25	U	5	U	25	U	25	U
1,1,2,2-Tetrachloroethane		25	U	25	U	25	U	5	U	25	U	25	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 5b

Cust ID:	AFTOUT-VOST-R3-TP5B		AFTOUT-VOST-R3-TP6F		AFTOUT-VOST-R3-TP6B		AFTOUT-VOST-R3-COND		VBLKRY		VBLKRU	
RFW#:	025		026		027		028		96LVQ018-MB1		96LVQ015-MB1	
Toluene	25	U	5	J	25	U	5	U	25	U	25	U
Chlorobenzene	25	U	25	U	25	U	5	U	25	U	25	U
Ethylbenzene	25	U	25	U	25	U	5	U	25	U	25	U
Styrene	25	U	25	U	25	U	5	U	25	U	25	U
Xylene (total)	3	J	25	U	25	U	5	U	25	U	25	U
2-chloroethylvinylether	100	U	100	U	100	U	10	U	100	U	100	U

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - [illegible]nville Laboratory

VOST TUBE BY GC/MS

Report Date: 02/20/96 16:01

RFW Batch Number: 9602L953   Client: COE-HOT GAS   Work Order: 02281012012 Page: 6a

		Cust ID:	VBLKRX		VBLKRO		VBLKRO BS		VBLKSE	
Sample Information		RFW#:	96LVQ017-MB1		96LVK031-MB1		96LVK031-MB1		96LVQ019-MB1	
		Matrix:	AIR		WATER		WATER		AIR	
		D.F.:	1.00		1.00		1.00		1.00	
		Units:	total ng		ug/L		ug/L		total ng	
	Toluene-d8		125	%	99	%	98	%	93	%
Surrogate	Bromofluorobenzene		109	%	90	%	93	%	84	%
Recovery	1,2-Dichloroethane-d4		118	%	90	%	98	%	79	%

		fl		fl		fl		fl
Chloromethane	28	J	10	U	10	U	50	U
Bromomethane	50	U	10	U	10	U	22	J
Vinyl Chloride	50	U	10	U	10	U	50	U
Chloroethane	50	U	10	U	10	U	50	U
Methylene Chloride	33		2	J	4	JB	25	
Acetone	500	U	10	U	10	U	500	U
Carbon Disulfide	25	U	5	U	5	U	25	U
1,1-Dichloroethene	25	U	5	U	114	%	25	U
1,1-Dichloroethane	25	U	5	U	5	U	25	U
1,2-Dichloroethene (trans)	25	U	5	U	5	U	25	U
Chloroform	25	U	5	U	5	U	25	U
1,2-Dichloroethane	25	U	5	U	5	U	25	U
2-Butanone	500	U	10	U	10	U	500	U
1,1,1-Trichloroethane	25	U	5	U	5	U	25	U
Carbon Tetrachloride	25	U	5	U	5	U	25	U
Vinyl Acetate	100	U	10	U	10	U	100	U
Bromodichloromethane	25	U	5	U	5	U	25	U
1,2-Dichloropropane	25	U	5	U	5	U	25	U
cis-1,3-Dichloropropene	25	U	5	U	5	U	25	U
Trichloroethene	25	U	5	U	115	%	25	U
Dibromochloromethane	25	U	5	U	5	U	25	U
1,1,2-Trichloroethane	25	U	5	U	5	U	25	U
Benzene	9	J	5	U	114	%	25	U
Trans-1,3-Dichloropropene	25	U	5	U	5	U	25	U
Bromoform	25	U	5	U	5	U	25	U
4-Methyl-2-pentanone	500	U	10	U	10	U	500	U
2-Hexanone	500	U	10	U	10	U	500	U
Tetrachloroethene	25	U	5	U	5	U	25	U
1,1,2,2-Tetrachloroethane	25	U	5	U	5	U	25	U

*= Outside of EPA CLP QC limits.

210

RFW Batch Number: 9602L953 Client: COE-HOT GAS Work Order: 02281012012 Page: 6b

013

Cust ID:	VBLKRX		VBLKRO		VBLKRO BS		VBLKSE	
RFW#:	96LVQ017-MB1		96LVK031-MB1		96LVK031-MB1		96LVQ019-MB1	
Toluene	25	U	5	U	108	%	25	U
Chlorobenzene	25	U	5	U	105	%	25	U
Ethylbenzene	25	U	5	U	5	U	25	U
Styrene	25	U	5	U	5	U	25	U
Xylene (total)	25	U	5	U	5	U	25	U
2-chloroethylvinylether	100	U	10	U	10	U	100	U

*= Outside of EPA CLP QC limits.

CASE NARRATIVE

Roy F. Weston, Inc.
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Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE LABORATORY ANALYTICAL REPORT

Client : COE-HOT GAS
RFW # : 9602L953

W.O #: 02281-012-012-9999-00
Date Received: 07 February 1996

GC/MS VOLATILE

The set of samples consisted of two (2) water samples and thirteen (13) air samples collected on VOST cartridges {i.e., pairs - front (tenax) and back (tenax/charcoal)} on 02,04 February 1996.

The samples were analyzed according to criteria set forth in SW 846 Method 5040/8240 for Volatile Organic target compounds on 09,10,11,12,13 February 1996.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. The required holding time for analysis was met.

2. Non-target compounds were detected in these samples.

3. Six (6) of one-hundred-two (102) surrogate recoveries were outside QC limits.

4. All blank spike recoveries were within QC limits.

5. The method blanks contained the common contaminant Methylene Chloride at levels less than 3x the CRQL. The method blank 96LVQ018-MB1 also contained the target compounds Bromomethane and Benzene at levels less than the CRQL; the method blank 96LVQ015-MB1 also contained the target compound Benzene at a level less than the CRQL; the method blank 96LVQ019-MB1 also contained the target compound Bromomethane at a level less than the CRQL; and the method blank 96LVQ017-MB1 also contained the target compounds Chloromethane and Benzene at levels less than the CRQL.

6. Internal standard areas were outside QC limits for samples AFTOUT-VOST-R3-COND and AFTOUT-VOST-R2-TP2F. Sample AFTOUT-VOST-R3-COND was reanalyzed on 14 February 1996 and yielded similar results. The reanalysis results are available upon request.

7. The calibration data has been reported using CLP Forms 6 and 7; however, VOST calibrations should not be expected to meet the calibration criteria specified on these forms.

8. The sample IDs were modified (truncated) to accommodate EPA nomenclature, which allows twenty (20) characters.

Bruce C. [illegible] unit leader 2-21-96

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

Date

mmz/voa/02-953v.cn

WESTON

GLOSSARY OF VOA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

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WESTON

GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

WESTON

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- **MP** - Missed Peak: manually added peak not found by automatic quan program.
- **PA** - Peak Assignment: quan report was changed to reflect correct peak assignment.
- **RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- **SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- **CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- **PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

QC SUMMARY

2A
AIR VOLATILE SURROGATE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	VBLKRU	98	127	101		0
02	AFTOUT-VOST-R2-TP1B	93	92	99		0
03	AFTOUT-VOST-R2-TP2B	78	84	113		0
04	AFTOUT-VOST-R2-TP3B	92	90	114		0
05	AFTOUT-VOST-R2-TP4B	90	85	125		0
06	VBLKRX	118	125	109		0
07	AFTOUT-VOST-R2-TP5B	105	106	129		0
08	AFTOUT-VOST-R2-TP6B	88	81	118		0
09	AFTOUT-VOST-SB-TP1B	96	110	101		0
10	AFTOUT-VOST-R3-TP1B	106	94	137		0
11	AFTOUT-VOST-R3-TP2B	117	104	179*		1
12	AFTOUT-VOST-R3-TP3B	108	101	165*		1
13	AFTOUT-VOST-R3-TP4B	121	107	190*		1
14	AFTOUT-VOST-R3-TP5B	111	116	179*		1
15	AFTOUT-VOST-R3-TP6B	116	111	179*		1
16	VBLKRY	106	147	113		0
17	AFTOUT-VOST-R2-TP1F	93	90	124		0
18	AFTOUT-VOST-R2-TP2F	65	106	113		0
19	AFTOUT-VOST-R2-TP3F	70	88	102		0
20	AFTOUT-VOST-R2-TP4F	95	99	133		0
21	AFTOUT-VOST-R2-TP5F	82	97	130		0
22	AFTOUT-VOST-R2-TP6F	68	102	113		0
23	AFTOUT-VOST-SB-TP1F	83	90	124		0
24	AFTOUT-VOST-R3-TP1F	86	115	113		0
25	VBLKSE	79	93	84		0
26	AFTOUT-VOST-R3-TP2F	108	96	109		0
27	AFTOUT-VOST-R3-TP3F	124	95	140		0
28	AFTOUT-VOST-R3-TP4F	102	114	160*		1
29	AFTOUT-VOST-R3-TP5F	80	84	98		0
30	AFTOUT-VOST-R3-TP6F	92	96	125		0

		QC LIMITS
S1 (DCE)	= 1,2-Dichloroethane-d4	(50-150)
S2 (TOL)	= Toluene-d8	(50-150)
S3 (BFB)	= Bromofluorobenzene	(50-150)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	VBLKRO	90	99	90		0
02	VBLKROMS	98	98	93		0
03	AFTOUT-VOST-R2-COND	96	102	98		0
04	AFTOUT-VOST-R3-COND	98	100	96		0
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		QC LIMITS
S1 (DCE)	= 1,2-Dichloroethane-d4	(76-114)
S2 (TOL)	= Toluene-d8	(88-110)
S3 (BFB)	= Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Matrix Spike - EPA CLP PR Sample No.: VBLKRO

COMPOUND	SPIKE ADDED (UG/L)	BLANK CONCENTRATION (UG/L)	BS CONCENTRATION (UG/L)	BS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.000	0.0000	56.757	114	61-145
Trichloroethene	50.000	0.0000	57.350	115	71-120
Benzene	50.000	0.0000	56.933	114	76-127
Toluene	50.000	0.0000	54.030	108	76-125
Chlorobenzene	50.000	0.0000	52.673	105	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 5 outside limits

COMMENTS: ____________________

FORM III VOA

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

Lab File ID: K2905   Lab Sample ID: 96LVK031-MB1

Date Analyzed: 02/09/96   Time Analyzed: 1449

Matrix: (soil/water) WATER   Level: (low/med) LOW

Instrument ID: 5970K

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	VBLKROMS	96LVK031-MB1S	K2906	1532
02	AFTOUT-VOST-R2-COND	9602L953-013	K2909	1724
03	AFTOUT-VOST-R3-COND	9602L953-028	K2910	1759
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COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON
Contract: 02281-012-012-9999-00

Lab Code:
Case No.:
SAS No.:
SDG No.: 9602L953

Lab File ID: Q021005
Lab Sample ID: 96LVQ015-MB1

Date Analyzed: 02/10/96
Time Analyzed: 1621

Matrix: (soil/water) AIR
Level:(low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	AFTOUT-VOST-R2-TP1B	9602L953-002	Q021009	1949
02	AFTOUT-VOST-R2-TP2B	9602L953-004	Q021010	2036
03	AFTOUT-VOST-R2-TP3B	9602L953-006	Q021012	2203
04	AFTOUT-VOST-R2-TP4B	9602L953-008	Q021013	2247
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COMMENTS: ______

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q021106 Lab Sample ID: 96LVQ017-MB1

Date Analyzed: 02/11/96 Time Analyzed: 1634

Matrix: (soil/water) AIR Level:(low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	AFTOUT-VOST-R2-TP5B	9602L953-010	Q021107	1716
02	AFTOUT-VOST-R2-TP6B	9602L953-012	Q021109	1833
03	AFTOUT-VOST-SB-TP1B	9602L953-015	Q021110	1912
04	AFTOUT-VOST-R3-TP1B	9602L953-017	Q021111	1949
05	AFTOUT-VOST-R3-TP2B	9602L953-019	Q021112	2027
06	AFTOUT-VOST-R3-TP3B	9602L953-021	Q021113	2103
07	AFTOUT-VOST-R3-TP4B	9602L953-023	Q021114	2141
08	AFTOUT-VOST-R3-TP5B	9602L953-025	Q021117	2357
09	AFTOUT-VOST-R3-TP6B	9602L953-027	Q021119	0103
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COMMENTS:

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q021218 Lab Sample ID: 96LVQ018-MB1

Date Analyzed: 02/12/96 Time Analyzed: 1859

Matrix: (soil/water) AIR Level:(low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	AFTOUT-VOST-R2-TP1F	9602L953-001	Q021219	2045
02	AFTOUT-VOST-R2-TP2F	9602L953-003	Q021220	2141
03	AFTOUT-VOST-R2-TP3F	9602L953-005	Q021221	2229
04	AFTOUT-VOST-R2-TP4F	9602L953-007	Q021222	2325
05	AFTOUT-VOST-R2-TP5F	9602L953-009	Q021223	0009
06	AFTOUT-VOST-R2-TP6F	9602L953-011	Q021224	0059
07	AFTOUT-VOST-SB-TP1F	9602L953-014	Q021225	0141
08	AFTOUT-VOST-R3-TP1F	9602L953-016	Q021226	0223
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COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: ROY F. WESTON
Contract: 02281-012-012-9999-00

Lab Code:
Case No.:
SAS No.:
SDG No.: 9602L953

Lab File ID: Q021305
Lab Sample ID: 96LVQ019-MB1

Date Analyzed: 02/13/96
Time Analyzed: 1018

Matrix: (soil/water) AIR
Level: (low/med) ______

Instrument ID: 1050Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	AFTOUT-VOST-R3-TP2F	9602L953-018	Q021306	1155
02	AFTOUT-VOST-R3-TP3F	9602L953-020	Q021309	1459
03	AFTOUT-VOST-R3-TP4F	9602L953-022	Q021310	1602
04	AFTOUT-VOST-R3-TP5F	9602L953-024	Q021311	1654
05	AFTOUT-VOST-R3-TP6F	9602L953-026	Q021312	1731
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COMMENTS:

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: K2404 BFB Injection Date: 02/04/96

Instrument ID: 5970K BFB Injection Time: 1107

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.9
75	30.0 - 60.0% of mass 95	50.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	80.0
175	5.0 - 9.0% of mass 174	6.3 (7.9)1
176	95.0 - 100.9% of mass 174	79.7 (99.6)1
177	5.0 - 9.0% of mass 176	4.8 (6.0)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD200	VSTD200	K2405	02/04/96	1122
02	VSTD100	VSTD100	K2406	02/04/96	1158
03	VSTD020	VSTD020	K2407	02/04/96	1233
04	VSTD010	VSTD010	K2408	02/04/96	1307
05	VSTD050	VSTD050	K2409	02/04/96	1347
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

Lab File ID: K2901   BFB Injection Date: 02/09/96

Instrument ID: 5970K   BFB Injection Time: 1217

Matrix:(soil/water) WATER   Level:(low/med) LOW   Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.7
75	30.0 - 60.0% of mass 95	50.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	86.2
175	5.0 - 9.0% of mass 174	6.7 (7.8)1
176	95.0 - 100.9% of mass 174	83.5 (96.8)1
177	5.0 - 9.0% of mass 176	5.4 (6.5)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	K2903	02/09/96	1310
02	VBLKRO	96LVK031-MB1	K2905	02/09/96	1449
03	VBLKROMS	96LVK031-MB1S	K2906	02/09/96	1532
04	AFTOUT-VOST-R2-COND	9602L953-013	K2909	02/09/96	1724
05	AFTOUT-VOST-R3-COND	9602L953-028	K2910	02/09/96	1759
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q020801 BFB Injection Date: 02/08/96

Instrument ID: 1050Q BFB Injection Time: 1357

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.4
75	30.0 - 60.0% of mass 95	39.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	90.7
175	5.0 - 9.0% of mass 174	6.6 (7.3)1
176	95.0 - 100.9% of mass 174	90.5 (99.8)1
177	5.0 - 9.0% of mass 176	7.1 (7.9)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q020803	02/08/96	1518
02	VSTD1000	VSTD1000	Q020804	02/08/96	1600
03	VSTD2000	VSTD2000	Q020805	02/08/96	1636
04	VSTD100	VSTD100	Q020807	02/08/96	1749
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q021001 BFB Injection Date: 02/10/96

Instrument ID: 1050Q BFB Injection Time: 1225

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0% of mass 95	22.3	
75	30.0 - 60.0% of mass 95	46.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.7	
173	Less than 2.0% of mass 174	0.0	(0.0)1
174	50.0 - 100.0% of mass 95	57.3	
175	5.0 - 9.0% of mass 174	3.9	(6.7)1
176	95.0 - 100.9% of mass 174	57.7	(100.6)1
177	5.0 - 9.0% of mass 176	4.0	(7.0)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q021003	02/10/96	1440
02	VBLKRU	96LVQ015-MB1	Q021005	02/10/96	1621
03	AFTOUT-VOST-R2-TP1B	9602L953-002	Q021009	02/10/96	1949
04	AFTOUT-VOST-R2-TP2B	9602L953-004	Q021010	02/10/96	2036
05	AFTOUT-VOST-R2-TP3B	9602L953-006	Q021012	02/10/96	2203
06	AFTOUT-VOST-R2-TP4B	9602L953-008	Q021013	02/10/96	2247
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5A
VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

Lab File ID: Q021101   BFB Injection Date: 02/11/96

Instrument ID: 1050Q   BFB Injection Time: 1309

Matrix: (soil/water) AIR   Level: (low/med) LOW   Column: (pack/cap) CAP

BLK 2/20/96

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.7
75	30.0 - 60.0% of mass 95	43.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	62.6
175	5.0 - 9.0% of mass 174	4.5 (7.1)1
176	95.0 - 100.9% of mass 174	61.7 (98.4)1
177	5.0 - 9.0% of mass 176	4.9 (8.0)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q021103	02/11/96	1424
02	VBLKRX	96LVQ017-MB1	Q021106	02/11/96	1634
03	AFTOUT-VOST-R2-TP5B	9602L953-010	Q021107	02/11/96	1716
04	AFTOUT-VOST-R2-TP6B	9602L953-012	Q021109	02/11/96	1833
05	AFTOUT-VOST-SB-TP1B	9602L953-015	Q021110	02/11/96	1912
06	AFTOUT-VOST-R3-TP1B	9602L953-017	Q021111	02/11/96	1949
07	AFTOUT-VOST-R3-TP2B	9602L953-019	Q021112	02/11/96	2027
08	AFTOUT-VOST-R3-TP3B	9602L953-021	Q021113	02/11/96	2103
09	AFTOUT-VOST-R3-TP4B	9602L953-023	Q021114	02/11/96	2141
10	AFTOUT-VOST-R3-TP5B	9602L953-025	Q021117	02/11/96	2357
11	AFTOUT-VOST-R3-TP6B	9602L953-027	Q021119	02/12/96	0103
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q021202 BFB Injection Date: 02/12/96

Instrument ID: 1050Q BFB Injection Time: 0155

Matrix: (soil/water) AIR Level: (low/med) LOW Column: (pack/cap) CAP

BKR 2/20/96

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.4
75	30.0 - 60.0% of mass 95	48.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	65.9
175	5.0 - 9.0% of mass 174	4.7 (7.1)1
176	95.0 - 100.9% of mass 174	66.0 (100.2)1
177	5.0 - 9.0% of mass 176	4.6 (7.0)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1000	VSTD1000	Q021205	02/12/96	0359
02	VSTD2000	VSTD2000	Q021206	02/12/96	0437
03	VSTD500	VSTD500	Q021207	02/12/96	0527
04	VSTD100	VSTD100	Q021212	02/12/96	1309
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID: Q021214 BFB Injection Date: 02/12/96

Instrument ID: 1050Q ms 2/21/96 BFB Injection Time: 1600

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.4
75	30.0 - 60.0% of mass 95	44.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	68.2
175	5.0 - 9.0% of mass 174	5.0 (7.4)1
176	95.0 - 100.9% of mass 174	68.8 (100.8)1
177	5.0 - 9.0% of mass 176	4.5 (6.6)2

1-Value is % of mass 174 2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q021216	02/12/96	1723
02	VBLKRY	96LVQ018-MB1	Q021218	02/12/96	1859
03	AFTOUT-VOST-R2-TP1F	9602L953-001	Q021219	02/12/96	2045
04	AFTOUT-VOST-R2-TP2F	9602L953-003	Q021220	02/12/96	2141
05	AFTOUT-VOST-R2-TP3F	9602L953-005	Q021221	02/12/96	2229
06	AFTOUT-VOST-R2-TP4F	9602L953-007	Q021222	02/12/96	2325
07	AFTOUT-VOST-R2-TP5F	9602L953-009	Q021223	02/13/96	0009
08	AFTOUT-VOST-R2-TP6F	9602L953-011	Q021224	02/13/96	0059
09	AFTOUT-VOST-SB-TP1F	9602L953-014	Q021225	02/13/96	0141
10	AFTOUT-VOST-R3-TP1F	9602L953-016	Q021226	02/13/96	0223
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5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

Lab File ID: Q021301   BFB Injection Date: 02/13/96

Instrument ID: 1050Q MT 3/21/96   BFB Injection Time: 0650

Matrix:(soil/water) AIR   Level:(low/med) LOW   Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	42.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	66.2
175	5.0 - 9.0% of mass 174	4.4 (6.6)1
176	95.0 - 100.9% of mass 174	66.7 (100.7)1
177	5.0 - 9.0% of mass 176	4.7 (7.0)2

1-Value is % of mass 174   2-Value is % of mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD500	VSTD500	Q021303	02/13/96	0824
02	VBLKSE	96LVQ019-MB1	Q021305	02/13/96	1018
03	AFTOUT-VOST-R3-TP2F	9602L953-018	Q021306	02/13/96	1155
04	AFTOUT-VOST-R3-TP3F	9602L953-020	Q021309	02/13/96	1459
05	AFTOUT-VOST-R3-TP4F	9602L953-022	Q021310	02/13/96	1602
06	AFTOUT-VOST-R3-TP5F	9602L953-024	Q021311	02/13/96	1654
07	AFTOUT-VOST-R3-TP6F	9602L953-026	Q021312	02/13/96	1731
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8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID (Standard): K2903 Date Analyzed: 02/09/96

Instrument ID: 5970K Time Analyzed: 1310

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	33265	7.37	117090	10.04	95025	16.73
	UPPER LIMIT	66530	7.87	234180	10.54	190050	17.23
	LOWER LIMIT	16632	6.87	58545	9.54	47512	16.23
	EPA SAMPLE NO.						
01	VBLKRO	31488	7.40	111067	10.06	90926	16.77
02	VBLKROMS	28385	7.41	97920	10.08	82571	16.79
03	AFTOUT-VOST-R2-COND	24299	7.42	85463	10.08	70866	16.77
04	AFTOUT-VOST-R3-COND	11732*	7.39	41601*	10.06	34682*	16.77
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

8A
VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON   Contract: 02281-012-012-9999-00

Lab Code: Case No.:   SAS No.:   SDG No.: 9602L953

Lab File ID (Standard): Q021003   Date Analyzed: 02/10/96

Instrument ID: 1050Q   Time Analyzed: 1440

Matrix:(soil/water) AIR   Level:(low/med) LOW   Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	64073	13.40	388304	15.15	408945	19.37
	UPPER LIMIT	128146	13.90	776608	15.65	817890	19.87
	LOWER LIMIT	32036	12.90	194152	14.65	204472	18.87
	EPA SAMPLE NO.						
01	VBLKRU	54534	13.40	329131	15.13	280207	19.35
02	AFTOUT-VOST-R2-TP1B	60931	13.42	320130	15.15	319333	19.38
03	AFTOUT-VOST-R2-TP2B	66334	13.40	402863	15.13	411670	19.35
04	AFTOUT-VOST-R2-TP3B	64599	13.42	365282	15.15	390272	19.38
05	AFTOUT-VOST-R2-TP4B	76089	13.40	417310	15.15	452388	19.37
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID (Standard): Q021103 Date Analyzed: 02/11/96

Instrument ID: 1050Q Time Analyzed: 1424

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	60428	13.42	382112	15.15	362053	19.37
	UPPER LIMIT	120856	13.92	764224	15.65	724106	19.87
	LOWER LIMIT	30214	12.92	191056	14.65	181026	18.87
	EPA SAMPLE NO.						
01	VBLKRX	53830	13.42	325586	15.15	292751	19.37
02	AFTOUT-VOST-R2-TP5B	51784	13.40	333278	15.13	342401	19.37
03	AFTOUT-VOST-R2-TP6B	59503	13.40	361682	15.13	382517	19.37
04	AFTOUT-VOST-SB-TP1B	57343	13.40	374774	15.13	335732	19.37
05	AFTOUT-VOST-R3-TP1B	59689	13.40	342751	15.13	369346	19.37
06	AFTOUT-VOST-R3-TP2B	68310	13.40	388538	15.13	427960	19.37
07	AFTOUT-VOST-R3-TP3B	66381	13.42	392428	15.15	423803	19.38
08	AFTOUT-VOST-R3-TP4B	66544	13.42	375930	15.15	408906	19.37
09	AFTOUT-VOST-R3-TP5B	56585	13.42	362122	15.15	382911	19.38
10	AFTOUT-VOST-R3-TP6B	61284	13.40	352164	15.13	383217	19.37
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID (Standard): Q021216 Date Analyzed: 02/12/96

Instrument ID: 1050Q Time Analyzed: 1723

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	55850	13.40	322151	15.13	277119	19.37
	UPPER LIMIT	111700	13.90	644302	15.63	554238	19.87
	LOWER LIMIT	27925	12.90	161076	14.63	138560	18.87
	EPA SAMPLE NO.						
01	VBLKRY	46511	13.40	278739	15.13	196478	19.37
02	AFTOUT-VOST-R2-TP1F	58528	13.40	381020	15.13	390990	19.35
03	AFTOUT-VOST-R2-TP2F	20689*	13.42	202762	15.13	178835	19.37
04	AFTOUT-VOST-R2-TP3F	39272	13.38	324086	15.12	321088	19.35
05	AFTOUT-VOST-R2-TP4F	51871	13.40	362509	15.13	386271	19.37
06	AFTOUT-VOST-R2-TP5F	46687	13.40	346682	15.13	342772	19.37
07	AFTOUT-VOST-R2-TP6F	33639	13.40	300765	15.13	275524	19.[illegible]
08	AFTOUT-VOST-SB-TP1F	57764	13.40	412484	15.13	429697	19.[illegible]
09	AFTOUT-VOST-R3-TP1F	57303	13.38	408131	15.12	364517	19.35
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ROY F. WESTON Contract: 02281-012-012-9999-00

Lab Code: Case No.: SAS No.: SDG No.: 9602L953

Lab File ID (Standard): Q021303 Date Analyzed: 02/13/96

Instrument ID: 1050Q Time Analyzed: 0824

Matrix:(soil/water) AIR Level:(low/med) LOW Column:(pack/cap) CAP

		IS1 (BCM) AREA #	RT	IS2 (DFB) AREA #	RT	IS3 (CBZ) AREA #	RT
	12 HOUR STD	54583	13.38	388751	15.12	337828	19.35
	UPPER LIMIT	109166	13.88	777502	15.62	675656	19.85
	LOWER LIMIT	27292	12.88	194376	14.62	168914	18.85
	EPA SAMPLE NO.						
01	VBLKSE	45778	13.38	330378	15.12	246161	19.35
02	AFTOUT-VOST-R3-TP2F	56927	13.38	357261	15.12	318660	19.35
03	AFTOUT-VOST-R3-TP3F	48844	13.38	295315	15.12	283486	19.35
04	AFTOUT-VOST-R3-TP4F	35498	13.40	276858	15.13	251379	19.35
05	AFTOUT-VOST-R3-TP5F	32037	13.40	245577	15.13	215215	19.35
06	AFTOUT-VOST-R3-TP6F	37432	13.38	278136	15.12	259141	19.33
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = +100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk.

DIOXINS AND FURANS

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of

Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans by

High-Resolution Chromatography / High-Resolution Mass Spectrometry

Method 23 (6/93)

Date:	February 21, 1996
Client ID:	Roy F. Weston, Inc.
P.O. Number:	
TLI Project Number:	36062

Rev. 06/02/95

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

Overview

Two M23 samples were received from Roy F. Weston, Inc. at 11 °C on February 02, 1996 under TLI project number 36049. Three more M23 samples were received on February 6, 1996 at 4°C. All samples were received in good condition and were stored in a refrigerator at 4°C. The samples and any associated QC samples were extracted and analyzed according to procedures described in the Triangle Laboratories' Data User's Manual (Rev. 12/92-HK-2-AH-2/93). Any particular difficulties encountered during the sample handling by Triangle Laboratories will be discussed in the QC Remarks section below. Results reported relate only to the items tested.

Quality Control Samples

A laboratory method blank, identified as the TLI Blank, was prepared along with the samples.

Quality Control Remarks

This release of this particular set of Roy F. Weston, Inc. analytical data by Triangle Laboratories was authorized by the Quality Control Chemist who has reviewed each sample data package individually following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Please consult Triangle Laboratories' Data User's Manual for further details. Specific QC issues associated with this particular project are:

Sample Preparation Laboratory: As per client's request, sample COE-HG-OUT-M23-SB was extracted and put on hold without having been analyzed until further notice.

Mass Spectrometry: The archived extract of sample COE-HG-AFTOUT-M23-R3 has been scheduled for fractionation due to very low internal standard recoveries upon initial analysis. The results of this sample will be forwarded as soon as they are available.

Data Review: None

Other Comments: Any analytes found in the TLI Blank are detected at a level equal to or less than the Target Detection Limit. This level of contamination is acceptable as per TLI guidelines. OCDD is not subject to blank contamination criteria as per TLI guidelines.

Sample Calculations:

Analyte Concentration

The amount of any analyte is calculated using the following expression.

$$Amt_{(\sigma)} = \frac{A_\sigma * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

$Amt_{(\sigma)}$ is the amount of a given analyte,

A_σ is the integrated current for the characteristic ions of the analyte,

A_β is the integrated current of the characteristic ions of the corresponding internal standard,

Q_β represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume (W = 1 for M23)

The amount is expressed in nanograms (ng) or picograms (pg).

Detection Limits

The detection limit reported for a target analyte that is not detected or presents an analyte response that is less than 2.5 times the background level is calculated by using the following expression. The area of the analyte is replaced by the noise level measured in a region of the chromatogram clear of genuine GC signals multiplied by an empirically determined factor. The detection limits represent the maximum possible concentration of a target analyte that could be present without being detected.

$$DL_{(\sigma)} = \frac{2 * 2.5 * (F * H) * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

$DL_{(\sigma)}$ is the estimated detection limit for a target analyte,

2.5 is the minimum response required for a GC signal,

F is an empirical number that approximates the area to height ratio for a GC signal. This number is 5 for the DB-5 GC column and 3.5 for the DB-225 GC column,

H is the height of the noise

A_{β} is the integrated current of the characteristic ions of the corresponding internal standard,

Q_{β} represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume

The detection limit is expressed in nanograms (ng) or picograms (pg).

Other sample calculations may be found in the Triangle Laboratories Data User's Manual.

Data Flags

In order to assist with data interpretation, data qualifier flags are used on the final reports, as discussed in Triangle Laboratories' Method 23 Data User's Manual. Please note that all data qualifier flags are subjective and are applied as consistently as possible. Each flag has been reviewed by two independent Chemists and the impact of the data qualifier flag on the quality of the data discussed above. The most commonly used flags are:

A **'B'** flag is used to indicate that an analyte has been detected in the laboratory method blank as well as in an associated field sample. The 'B' flag will be used only when the concentration of analyte found in the sample is less than 20 times that found in the associated blank. This flag denotes possible contribution of background laboratory contamination to the concentration or amount of that analyte detected in the field sample. Under Triangle Laboratories guidelines, a laboratory blank is acceptable if the tetra- through hepta-CDD/CDF levels are all below the target detection limits (TDLS) or if the contamination levels are less than 5% of the levels detected in the associated field samples. If these conditions are satisfied or if the blank is unable to be reextracted, the interpretation of the contamination levels relative to the samples should be as follows: 1) analyte quantitations should be considered valid if the level of blank contamination is less than five percent of the level detected in the field sample, 2) analyte quantitations should be considered estimated if the analyte level in the sample is five to twenty times the level

of the analyte in the blank, or 3) analytes whose level in a sample is the same as or less than five times the level detected in the associated blank should be considered present likely due to laboratory contamination and not native to the sample.

An **'E'** flag is used to indicate that an PCDF peak has eluted at the sample time as the associated diphenyl ether (DPE) and that the DPE peak intensity is ten percent or more of the PCDF peak intensity. Total PCDF values are flagged 'E' if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks are quantitated with EMPC values, regardless of the isotopic abundance ratio. These EMPC values are most likely overestimated due to the DPE contribution to the peak area.

An **'I'** flag is used to indicate labeled standards have been interfered with on the GC column by coeluting, interferent peaks. The interference may have caused the standard's area to be overestimated. All quantitations relative to this standard, therefore, may be underestimated.

A **'PR'** flag is used to indicate that a GC peak is poorly resolved. This resolution problem may be seen as two closely eluting peaks without a reasonable valley between the peak tops, overly broad peaks, or peaks whose shapes vary greatly from a normal distribution. The concentrations or amounts reported for such peaks are most likely overestimated.

A **'Q'** flag is used to indicate the presence of QC ion instabilities caused by quantitative interferences. Affected analytes may be overestimated or underestimated as a result of this interference. A peak is flagged 'Q' only if it is affected by a QC ion deviation greater than 20% full scale as determined relative to the labeled standard against which it is quantitated. Total PCDF/PCDF quantitations will be flagged 'Q' if the interferences affect ten percent or more of the total PCDD/PCDF peak areas.

An **'RO'** flag is used to indicate that a labeled standard has an ion abundance ratio that is outside of the acceptable QC limits, most likely due to a coeluting interference. This may have caused the percent recovery of the standard to be overestimated. All quantitations versus this standard, therefore, may be underestimated.

A **'U'** flag is used to indicate that a specific (2,3,7,8-substituted)-isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration/amount cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

A **'V'** flag is used to indicate that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

By our interpretation, the analytical data in this project are valid based on the guidelines of EPA Method 23 (6/93) and Triangle Laboratories' Method 23 Data User's Manual. Any specific QC concerns or problems have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the data. Should Roy F. Weston, Inc. have any questions or comments regarding this data package, please feel free to contact our Project Scientist Selena Armistead, at 919/544-5729 ext. 268.

For Triangle Laboratories, Inc.,

Report Preparation

Vijay S. Chhabra
Report Preparation Chemist

Quality Control

S. A. Panis
Saroj A. Panlan 02/21/96

Report Preparation Chemist

The total number of pages in the data package is : 174 .

DOCUMENT CONTROL

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page ____ of ____

Client [illegible]
Est. Final Proj. Sampling Date
Work Order # 02281-012-012
Project Contact/Phone # [illegible]
AD Project Manager [illegible]
QC [illegible] Del [illegible] TAT
Date Rec'd ________ Date Due ________
Account # ________

Refrigerator #															
#/Type Container	Liquid														
	Solid														
Volume	Liquid														
	Solid														
Preservatives															
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN					

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

WESTON Analytics Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb
	[illegible]-M23-R				1/21					X
	[illegible]-M23-R									X
	[illegible]-M23-R									X
	[illegible]-M23-R									X
	[illegible]-M23-R									X
	[illegible]-M23-B				1/21					X
	[illegible]-M23-B									X
	[illegible]-M23-B									X
	[illegible]-M23-B									X
	[illegible]-M23-B									X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. [illegible]
2. [illegible]
3. [illegible]
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
	[illegible]	[illegible]					

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ________
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# ________ Cooler# ________ 381-596a

8

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page ___ of ___

Client [illegible]
Est. Final Proj. Sampling Date
Work Order # [illegible]-012-011-1200
Project Contact/Phone # [illegible] (610) 701 7201
AD Project Manager [illegible]
QC [illegible] Del [illegible] TAT
Date Rec'd ___ Date Due ___
Account # ___

Refrigerator #		
#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		
ANALYSES REQUESTED →		ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb				Metal	CN					
	[illegible]	[illegible]	[illegible]		[illegible]					X						R 3				
	[illegible]	[illegible]	[illegible]							X										
	[illegible]	[illegible]	[illegible]							X										
	[illegible]	[illegible]	[illegible]							X										
	[illegible]	[illegible]	[illegible]							X										

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___

RFW 21-21-001/A-7/91

381-596a

PCDD/PCDF

Custody Transfer Record/Lab Work Request

WESTON Analytics Use Only

WESTON

Page 1 of 1

Client: CDE-HOT GAS
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-1200
Project Contact/Phone #: Jeff O'Neill 610-701-7201
AII Project Manager: Selena Armistead
QC: SDD Del: SDD TAT:
Date Rec'd: ______ Date Due: ______
Account #:

Refrigerator #:
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives:

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

WESTON Analytics Use Only

EPA Method 23 (PCDD/PCDF)

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Notes
	CDE-H6-APTOUT-M23-R1-F/HS				1/21/96					X	Run One
	CDE-H6-APTOUT-M23-R1-FILT									X	
	CDE-H6-APTOUT-M23-R1-XAD									X	
	CDE-H6-APTOUT-M23-R1-B/HS									X	
	CDE-H6-APTOUT-M23-R1-TOL									X	
	CDE-H6-001-M23-SB-ACE/DCM				1/21/96					X	Site Blanks
	CDE-H6-001-M23-SB-FILT									X	
	CDE-H6-001-M23-SB-XAD									X	
	CDE-H6-001-M23-SB-TOL									X	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Analyze site blank only if contamination found in blank train sample.

DATE/REVISIONS:
1. Combine fractions
2. with other train
3. fractions for
4. total run composite
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
	John Smith	2/1/96	12:00				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ______
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ______ Cooler# ______ 381-596a

Custody Seal : Absent Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Absent	TLI Project Number: 36049	Book 113
		Client: RFW01 — Roy F. Weston. Inc.	
		Date Received: 02/02/96 — By [signature]	Page 204
Box	ICE — Temp 11.0 C	Carrier and Number: FedEx/2350390884	

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-204-1A	COE-HG-AFTOUT-M23-R1-FILT	FILTER C01	2/07/96 SBm	Empty						
113-204-1B	COE-HG-AFTOUT-M23-R1-XAD	XAD C01								
113-204-1C	COE-HG-AFTOUT-M23-R1-FHS	FH/RINSE C01								
113-204-1D	COE-HG-AFTOUT-M23-R1-BHS	BH/RINSE C01								
113-204-1E	COE-HG-AFTOUT-M23-R1-TOL	TOLUENE C01								
113-204-2A	COE-HG-OUT-M23-SB-FILT	FILTER C01								
113-204-2B	COE-HG-OUT-M23-SB-XAD	XAD C01								
113-204-2C	COE-HG-OUT-M23-SB-ACE/DCM	ACE/MECL2 C01								
113-204-2D	COE-HG-OUT-M23-SB-TOL	TOLUENE C01								

Receiving Remarks: Samples received 2/2/96. logged in 2/4/96.

Archive Remarks:

TRIANGLE LABORATORIES. INC.--CHAIN OF CUSTODY--REVISED 02/17/95

Custody Seal : Present/Intact Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Present	TLI Project Number	36062
		Client: RFW01	Roy F. Weston. Inc.
		Date Received	02/06/96 By [signature]
Ice Chest	ICE Temp 4.0 C	Carrier and Number	FedEx/

Book 113 Page 217

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-1A	COE-HG-AFTOUT-M23-R2-C01	FILTER	2/07 KC sbm	Empty						
113-217-1B	COE-HG-AFTOUT-M23-R2-C01	XAD								
113-217-1C	COE-HG-AFTOUT-M23-R2-C01	FH/RINSE								
113-217-1D	COE-HG-AFTOUT-M23-R2-C01	BH/RINSE								
113-217-1E	COE-HG-AFTOUT-M23-R2-C01	TOLUENE								
113-217-2A	COE-HG-AFTOUT-M23-R3-C01	FILTER								
113-217-2B	COE-HG-AFTOUT-M23-R3-C01	XAD								
113-217-2C	COE-HG-AFTOUT-M23-R3-C01	FH/RINSE								
113-217-2D	COE-HG-AFTOUT-M23-R3-C01	BH/RINSE								
113-217-2E	COE-HG-AFTOUT-M23-R3-C01	TOLUENE								

Receiving Remarks:

Archive Remarks:

Custody Seal : Present/Intact Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Present	TLI Project Number	36062	Book
		Client: RFW01	Roy F. Weston. Inc.	113
		Date Received	02/06/96 By	Page
Ice Chest ICE	Temp 4.0 C	Carrier and Number	FedEx/	217

TLI Number mR/H:CPM Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-3A COE-HG-AFTOUT-M23-BT-C01	FILTER	2/07/96 sbm	Empty						
113-217-3B COE-HG-AFTOUT-M23-BT-C01	XAD								
113-217-3C COE-HG-AFTOUT-M23-BT-C01	FH/RINSE								
113-217-3D COE-HG-AFTOUT-M23-BT-C01	BH/RINSE								
113-217-3E COE-HG-AFTOUT-M23-BT-C01	TOLUENE								

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC.
SAMPLE TRACKING AND PROJECT MANAGEMENT FORM

-------------------------ADMINISTRATIVE INFORMATION-------------------------

TLI Proj#: 36062-
Prod Code: D23451
DetectLim: .05 ng

Samples: 5
Matrix.: M23
Type...: A

TurnAround.: 21 Day(s)
Hold Time..: 0 Day(s)
Date Recvd.: 02/06/96
Date Due...: 02/27/96
DWL Due Dt.: 02/16/96

Analyte List.: Tetra-Octa PCDDs/PCDFs

Method.......: Method 23: T-O, Toluene Combined
Client Proj..: COE Hot Gas Program
Client.......: Roy F. Weston, Inc. (RFW01)
P.O. No......:
Contact......: Jeff O'Neill
Proj. Mgr....: Selena Armistead

Collect Dt/Tm: 02/02/96
Phone........: 610-701-7201
Fax..........: 610-701-3187
Sample Origin:

-------------------SPECIAL INSTRUCTIONS / QA REQUIREMENTS-------------------

Prep Project: 02518

Prespike Standard: USF-C and USF-S
Prespike Amount..: 4.0ng

---------------------------REPORTING REQUIREMENTS---------------------------

Reporting Format: Report Option II

See MILES for Instructions/Communications.

Completed by: Selena Armistead DATE: 2/7/96

Reviewed by: SA DATE: ________ (PMGT0395)

⑥ Pre-spiked XAD clean

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96 TLI BLANK
SPIKE .0ng USF-C & USF-S
SPIKER CMC
PREPARER G.L.
WESTON

① XAD-clean, 1Filter-clean, 1g/Asswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R1-XAD
Project:36049
113-204-1B

RFW01-Roy F. Weston. Inc.
COE-HG-AFTOUT-M23-R1-FILT
Project:36049
113-204-1A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMC
PREPARER G.L.
WESTON

Client COE - HOT GAS
Plant ALPINE, AL
Source AFTERBURNER OUTLET Date 3/1/96
Run No. 1 PCDF
Sample Method METHOD 23
Sample Type

② XAD-clean, 1Filter-clean 1g/Asswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R2-
Project:36062
113-217-1B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R2-
Project:36062
113-217-1A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMC
PREPARER G.L.
WESTON

(3) XAD-clean, 1Filter-clean, glasswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-R3-
Project:36062
113-217-2B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23 -R3-
Project:36062
113-217-2A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

(4) XAD-clean, 1Filter-clean, glasswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-BT-
Project:36062
113-217-3B

RFW01-Roy F. Weston, Inc.
COE-HG-AFTOUT-M23-BT-
Project:3606
113-217-3A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPIKER CMR
PREPARER G.L.
WESTON

(5) 1Filter clean, XAD-clean, glasswool-clean

RFW01-Roy F. Weston, Inc.
COE-HG-OUT-M23-SB-XAD
Project:36049
113-204-2B

...ton, Inc.
...B-FILT
...049

RFW01-Roy F. Wes...
COE-HG-OUT-M23-S...
Project:36...
113-204-2A

Triangle Laboratories, Inc.
TLI PROJECT# 02518
DATE 1/19/96
SPIKE .0ng USF-C & USF-S
SPI... CMR
... G.L.

...TERRA
...TE Blank
... Method
XAD

ate: 02/10/96
ime: 18:31

TRIANGLE LABORATORIES, INC.
Wet Lab MM5/PUF Observations
Project: 36062

Sample #	crd	TLI_Number..	Customer.Sample.Id.......	F. No	XAD Color.....	Filter Color.....	Glass Wool Color.....	PUF Color.....	Odor.....	Air Q.No.	Entered.By......	Date....	Time....	S
000		TLI Blank	TLI M23 Blank	0	clean					02518	mercer	02/08	01:19	F
001		113-204-1A-E	COE-HG-AFTOUT-M23-R1	1	clean	cream	clean			02518	mercer	02/08	01:19	F
002		113-217-1A-E	COE-HG-AFTOUT-M23-R2	1	clean	cream	clean			02518	mercer	02/08	01:19	F
003		113-217-2A-E	COE-HG-AFTOUT-M23-R3	1	clean	cream	clean			02518	mercer	02/08	01:19	F
004		113-217-3A-E	COE-HG-AFTOUT-M23-BT	1	clean	clean	clean			02518	mercer	02/08	01:19	F
005		113-204-2A-D	COE-HG-OUT-M23-SB	1	clean	clean	clean			02518	mercer	02/08	01:19	F

*** End of Report ***

TRIANGLE LABORATORIES, INC.

PCDD/PCDF/PBDD/PBDF Sample Preparation Tracking & Management Form

Project: 36062

Client: Roy F. Weston, Inc. (RFW01)

Sample Information:

Method: Method 23: T-O, Toluene Combined

Extraction Date: 2/07/96

Spiking Dates: 2/07/96 2/8/96 __/__/__ __/__/__

WL Spike: 40 µl, conc: 0.100 ng/µl

SBM SBM

S#.crd	TLI SAMPLE ID / CLIENT SAMPLE ID	GROSS WEIGHT Before	GROSS WEIGHT After	SAMPLE SIZE g / ml	USF-I Ex/Cl Initials 40 µl	USF-A Ex/Cl Initials 40 µl	MISC Ex/Cl Initials	USFMX Extr. Initials	Sample Left ? Yes/No
000	TLI Blank / TLI M23 Blank			1	[illegible]	[illegible]			Y2
001	113-204-1A-E / COE-HG-AFTOUT-M23-R1			1	[illegible]	[illegible]			Y2
002	113-217-1A-E / COE-HG-AFTOUT-M23-R2			1	[illegible]	[illegible]			Y2
003	113-217-2A-E / COE-HG-AFTOUT-M23-R3			1	[illegible]	[illegible]			Y2
004	113-217-3A-E / COE-HG-AFTOUT-M23-BT			1	[illegible]	[illegible]			Y2
005	113-204-2A-D / COE-HG-OUT-M23-SB			1	[illegible]	[illegible]			Y2

Gross weight of sample container + sample before/after aliquot removal

#005 Extract and HOLD

COMMENTS:

Initial/Date SBM 2/07/96

Indicate below the TLI Identification Number of the Sample Fortification Solutions:

USF-AIS: ______

USF-I: 3345G 0.1ug/ml Ex. 11/26/96 USF-A: 3496A Exp 11/14/96 0.1ug/ml

USF-ACS: ______ USF-MX: ______

USF-C: ______ Other: ______

LOT # (Solvents): Toluene 950743

for extraction: ______

INITIALS OF BOTH THE SPIKER AND OBSERVER MUST BE ENTERED.

(XXXXX = Gross Weight not provided for WATER Samples.)

TRIANGLE LABORATORIES, INC.
SAMPLE EXTRACTION and CLEANUP TRACKING FORM
TLI Project: 36062

	EXTRACTION			CHROMATOGRAPHIC CLEANUP							
Ext S#.crd and TLI Number	Spike before Extr. ✓	Extr. ✓	Spike after Extr.	Acid Base	Big Fish	Escltd Silica Gel ✓	Acid Almina 6 gm ✓	Flor-isil	Carbon Column ✓	Trans-fer ✓	Add'l Clean-up
000 TLI Blank	SDP 2/07/96	SBM 2/07/96	SBM [illegible]			DSP 248	DSP 248	DSP 248	DSP 248	2/10/96	
001 113-204-1A-E											
002 113-217-1A-E											
003 113-217-2A-E											
004 113-217-3A-E											
005 113-204-2A-D								SBM 2/9/96			
			2-8-96							QS	

...PROCEDURE....	......DETAILS......	Performed.By	Observed.By	....DATE....
Spike		SBM	SDD	2/07/96
Soxhelet Ext.		SBM		2/07/96
Rotovap	40mL, 10mL, Dryness	QDP		2/8/96
Combine		N/A		/ /
Divide	50:50	QDP		2/8/96
Solvent Exchange				/ /
Add Tridecane	*QDP	~~[illegible]~~		2/8/96

Comments Tridecane needs to be added after extraction
*Tridecane was added QDP 2-8-96

Rev 01/25/96 (PSTMF 4)

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 36062

Transfer From: DWLH5 To: DMS5

	Initials..	Date.......	Time...
Released by:	GS	2/10/96	7:00 PM
Accepted by:	BD	2/11/96	04:25

MILES.ID........		TLI_No......	Cust.Id..................
36062-	-000	TLI Blank	TLI M23 Blank
36062-	-001	113-204-1A-E	COE-HG-AFTOUT-M23-R1
36062-	-002	113-217-1A-E	COE-HG-AFTOUT-M23-R2
36062-	-003	113-217-2A-E	COE-HG-AFTOUT-M23-R3
36062-	-004	113-217-3A-E	COE-HG-AFTOUT-M23-BT

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TRIANGLE LABORATORIES, INC.
HR GC/HRMS ANALYSIS

Method: Method 23: T-O, Toluene Combined
Required Detection Limit: .05 ng

PROJECT: 36062

SAMPLE INFORMATION

RS Conc 20 µl @ 0.1 NG/µl

S#.crd	TLI SAMPLE ID / CLIENT SAMPLE ID	1ST COLUMN GC/MS FILENAME COLUMN: DB-5	CONFIRM	2ND COLUMN CONFIRM FILENAME COLUMN: DB-225	USF-RS VOLUME 20.0 SOLN ID 5370K	USF-RS INIT. MM DATE 2/12/96	ANALYSIS COMMENTS
000	TLI Blank / TLI M23 Blank	~~X961034~~ 35 ISD 2/17/96		X960511			
001	113-204-1A-E / COE-HG-AFTOUT-M23-R1 ~~ISD 2/17/96~~	X961057 ~~X961046~~	YES	X960512			
002	113-217-1A-E / COE-HG-AFTOUT-M23-R2	X961058		X960513			
003	113-217-2A-E / COE-HG-AFTOUT-M23-R3	X961059		X960514			
004	113-217-3A-E / COE-HG-AFTOUT-M23-BT	X961060		X960515			
005	*113-204-2A-D / COE-HG-OUT-M23-SB				EG MM 2/12/96		

Comments: *Extract and Hold Samples 2/7/96

Type: A

Spike File: SPX23704

Amt of Extract: 50%

REV 03/07/95 (PSTMF 6)

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
708	DB5 60M 0.25M	5897824	QTLIPKD	M02/T02	2.0λ	EPCUS2	EPCUS

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332:	OP INIT	P	Q	SYR #	FILE #
7/16/96	15:55	—			MASS CALIBRATE	—	—	VCA			—	8961022
↓	16:01	—	3499D	-	RTCHK		8%	VCA	✓	✓	AUTO	8961023
↓	16:46	—	3490B	—	8290/M23 Conical 50	NG Δ linear	2.1 E6	JF	✓	✓	AUTO	5961024
↓	17:55	—	3490B	—	8290/M23 Conical 50	NG	2.5 E6	JF	✓	✓	AUTO	5961025
↓	19:00	—	3490B	—	8290/M23 Conical 50	Ratio Pinto out	3.0 E6	JF	✓	✓	AUTO	5961026
↓	20:31	—	3490B	—	8290/M23 Conical 50	NG	2.8 E6	JF	✓	✓	AUTO	5961027
↓	21:23	—	3490B	—	8290/M23 Conical 50	NG	2.6 E6	JF	✓	✓	AUTO	5961028
↓		—	3499D	—	RTCHK			JF	-	-	AUTO	5961029
		—	3490TB	—	8290/M23 Conical SCR	(MT Tune) (Good)	1.2 E6	BD	✓	✓	AUTO	$961030
7/17/96	09:19	—	3499D	-	RTCHK		10%	BD	✓	✓	AUTO	$961031
↓	10:27	~~36120~~	~~TLI BLANK~~	~~0~~	~~TLI Method 27 Blank~~	e.l. BD 2/17/96					~~AUTO~~	~~$961032~~
↓		~~35982~~	~~TLI Blank~~	~~0~~	~~TLI Blank~~							~~$961033~~
↓		~~36062~~	~~TLI Blank~~	~~0~~	~~TLI M23 Blank~~							~~$961034~~
↓		~~36120~~	~~114-25-4A-E~~	~~4~~	~~2-$-M23-FB~~							~~$961035~~
↓		~~36120~~	~~114-25-1A-E~~	~~1~~	~~1-$-M23-1~~							~~$961036~~

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TRIANGLE ORATORIES INC
RUN LOG

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
70#	DB-5 60 0.25 μm	5897824	@TLIPKD →	TCD →	2.0 μL	EPC4#2	EPC4#

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332.	OP INIT	P	Q	SYR #	FILE #
2/17/96	14:33	—	3370L	—	RS-100	(m 410 - 409)	/	BD	✓	✓	AUTO	#961032
	15:18	36120	TLI BLANK	0	TLI Method 23 Blank	ALL 1423	8.1E5	BD	✓	✓		#961033
	15:59	35982	TLI BLANK	0	TLI BLANK		9.2E5	BD	✓	✓		#961034
	16:40	36082	TLI BLANK	0	TLI M23 BLANK		1.1E6	BD	✓	✓		#961035
	17:20	36120	114-25-4A-E	4	2-$-M23-FB		8.2E5	BD	✓	✓		#961036
	18:01	36120	114-25-1A-E	1	1-$-M23-1		1.0E6	BD	✓	✓		#961037
	18:42	36120	114-25-2A-E	2	2-$-M23-1	R.O. IS (Rec DF) RESHOOT	1.1E6	BD	✓	✓		#961038
	19:20	36120	114-25-3A-E	3	2-$-M23-3		1.1E6	BD	✓	✓		#961039
		35982	113-207-10 / 113-137-1	1	K2-DB-2A, K2-DB-2B			BD	✓	✓		#961040
		35982	113-207-7,8 / 113-137-2	2	K2-DT-1A,B, K2-DT-1C			BD	✓	✓		#961041
		35982	113-207-9 / 113-137-3	3	K2-DT-2A, K2-DT-2B	Off the		BD	✓	✓		#961042
		35982	113-207-6 / 113-137-4	4	K2-DB-1A, K2-DB-1B	clock;		BD	✓	✓		#961043
		35982	113-207-13 / 113-137-5	5	K2-DT-3A, K2-DT-3B	RESHOOT		BD	✓	✓		#961044
	2324	—	3490B	—	M23/8290 Concal 50.0	Good T-0	3.1E6	BD	✓	✓		#961045
2/18/96	06:02	—	3499D	.	RTCHK	Δ Liner		GM			AUTO	#961046

3EEIS 2-17-96 PCB

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TRIANGLE LABORATORIES INC
RUN LOG

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
70$	DB-5 60m 0.25µm	5897824	@TLIPKD	T202 →	2.0 µL	EPCU$2	EPCU$

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332:	OP INIT	P	Q	SYR #	FILE #
2/18/96	06:45	—	3490B	—	8290/M23 Concal 50	NG: PeCDF R.O.	2.4 EG	Gm	✓	✓	Auto	$961047
↓		~~—~~	~~3490B~~	~~—~~	~~8290/M23 Concal 50~~	Δ Line - No injection This		Line. 2/18/96 BD			~~Auto~~	~~$961048~~
2/18/96	20:32	—	3499D	—	RTCHK	Good.	3.3 ES	JFK	✓	✓	AUTO	$961049
2/18/96	21:16	—	3490B	—	8290/M23 CONCAL	NG PeCDD 2D=36.5	1.6 EG	JFK	✓	✓	AUTO	$961050
2/18/96	22:31	—	3490B	—	8290/M23 CONCAL	Δ NG PeCDF I.S. ratio PeCDD I.S. %D	1.8 EG	JFK	✓	✓	AUTO	$961051
2/19/96	08:50	—		—	MASS CALIBRATE	—	—	VM	—	—		$961052
↓	09:07	—	3490B	—	8290/M23 Cal 50	Good M-0 F/B 8290 M23	1.8 EG	VM	✓	✓	Auto	$961053
↓	10:04	—	3499D	—	RTCHK	Good	10%	VM	✓	✓	Auto	$961054
↓	10:55	~~361~~	3370M	—	RS100		2.5 EG	VM	✓	✓	Auto	$961055
↓	11:36	36120	114-25-2A-E	2	2-S-M23-1		2.2 EG	VM	✓	✓	Auto	$961056
↓	12:17	36062	113-204-1A-E	1	COE-HG-AFTOUT-M23	-R1	2.6 EG	VM	✓	✓	Auto	$961057
↓	12:58	36062	113-217-1A-E	2	COE-HG-AFTOUT-M23	-R2	2.8 EG	VM	✓	✓	Auto	$961058
↓	13:38	36062	113-217-2A-E	3	COE-HG-AFTOUT-M23	-R3	2.5 EG	VM	✓	✓	Auto	$961059
↓	14:19	36062	113-217-3A-E	4	COE-HG-AFTOUT-M23	-DT	2.6 EG	VM	✓	✓	Auto	$961060
↓		35982	RE BLANK	0	TLE BLANK			VM			Auto	$961061

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[redacted]

[illegible] ETZFPXD	TT1	2.0 ul	xcont_OT	xconf_OT

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332	OP INIT	P	Q	SYR #	FILE #
9/10/96	13:05	35980	113-175-1	2	Composite 1/22 to 1/26		1.4 E7	GL	✓	✓	X2081	X960504
9/12/96	09:02	-	3449C	-	Rhelsk		21%	MM	✓	✓	Rhelsk	X960505
↓	10:18	-	3474A	-	Tetra Conical 5.0	Good	1.8 E7	MM	✓	✓	Tetra 5.0	X960506
↓	11:27	-	30705	-	RS-100	~~Change~~	1.5 E7	MM	—	—	RS 100	X960507
↓	12:16	36079A	TL1 Blank ~~113-234-1A-D~~	~~1~~	TL1 M23 Blank ~~R-1~~ 60mm 9/12/96		2.1 E7	MM	✓	✓	X2081	X960508
↓	13:38	↓	113-234-1A-D	1	R-1		3.3 E7	MM	✓	✓	X2081	X960509
↓	14:26	↓	113-234-2A-D	2	R-2		2.2 E7	MM	✓	✓	X2081	X960510
↓	15:15	360602	TL1 Blank	∅	TL1 M23 Blank		2.0 E7	MM	✓	✓	X2121	X960511
↓	16:03	↓	113-204-1A-E	1	COE-HG-AFTOUT-M23-R1		2.2 E7	MM	/	/	X2121	X960512
	16:51	360602	113-217-1A-E	2	COE-HG-AFTOut-M23-R2		2.0 E7	BB	/	/	X2121	X960513
	17:40	360602	113-217-2A-E	3	COE-HG-AFTout-M23-R3		2.2 E6	BB	/	/	X2121	X960514
	18:32	360602	113-217-3A-E	4	COE-HG-AFTout-M23-BT		8.0 E6	BB	/	/	X2121	X960515
	19:46	36092	113-247-1	1	B-1		1.8 E7	BB	/	/	X2121	X960516
	20:38	36092	113-247-2	2	B-2		2.6 E7	BB	/	/	X2121	X960517
	21:24	36092	113-247-3	3	B-3		9.6 E6	BB	/	/	X2121	X960518

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SAMPLE DATA

TRIANGLE LABORATORIES, INC.
Sample Result Summary for Project 36062
Method 23X Full Screen Analyses (DB-5)

Data File	S961035	S961057	S961058	S961060
Sample ID	TLI M23 Blank	COE-HG-AFTOUT-M 23-R1	COE-HG-AFTOUT-M 23-R2	COE-HG-AFTOUT-M 23-BT
Units	ng	ng	ng	ng
Analytes				
2378-TCDD	(0.03)	0.04	{0.02}	{0.006}
12378-PeCDD	(0.03)	0.16	0.07	0.02
123478-HxCDD	(0.04)	0.13	0.06	(0.03)
123678-HxCDD	(0.03)	0.15	0.05	(0.02)
123789-HxCDD	(0.03)	0.33	0.11	(0.02)
1234678-HpCDD	(0.03)	1.2	0.34	0.07
OCDD	(0.04)	3.1	1.1	{0.17}
2378-TCDF	(0.02)	0.04	0.07	(0.009)
12378-PeCDF	(0.03)	(0.02)	0.01	(0.01)
23478-PeCDF	(0.03)	(0.02)	0.03	(0.01)
123478-HxCDF	(0.02)	0.02	0.04	(0.02)
123678-HxCDF	(0.02)	0.01	0.02	(0.01)
234678-HxCDF	(0.02)	0.02	0.03	(0.02)
123789-HxCDF	(0.03)	(0.01)	(0.02)	(0.02)
1234678-HpCDF	(0.02)	0.05	0.08	(0.02)
1234789-HpCDF	(0.03)	{0.01}	0.01	(0.03)
OCDF	(0.03)	0.08	0.05	(0.04)
TOTAL TCDD	(0.03)	0.84	0.36	0.02
TOTAL PeCDD	(0.03)	1.9	0.79	0.03
TOTAL HxCDD	(0.03)	2.6	0.96	0.14
TOTAL HpCDD	(0.03)	2.8	0.75	0.07
TOTAL TCDF	(0.02)	0.04	0.14	(0.009)
TOTAL PeCDF	(0.03)	0.13	0.28	(0.01)
TOTAL HxCDF	(0.02)	0.16	0.20	(0.01)
TOTAL HpCDF	(0.03)	0.13	0.16	(0.02)
Other Standards Percent Recovery Summary (% Rec)				
37Cl-TCDD	87.1	95.9	95.0	89.6
13C12-PeCDF 234	105	118	116	105
13C12-HxCDF 478	84.1	92.0	90.4	95.0
13C12-HxCDD 478	99.2	107	106	111
13C12-HpCDF 789	92.2	98.4	98.4	90.4
Other Standards Percent Recovery Summary (% Rec)				
13C12-HxCDF 789	81.6	87.4	86.4	96.0
13C12-HxCDF 234	85.9	93.0	89.3	100
Internal Standards Percent Recovery Summary (% Rec)				
13C12-2378-TCDF	45.7	51.7	53.6	74.1
13C12-2378-TCDD	53.4	57.6	59.5	82.4
13C12-PeCDF 123	55.3	55.7	58.2	74.2
13C12-PeCDD 123	77.7	72.0	76.8	92.5
13C12-HxCDF 678	70.0	72.8	71.3	89.4
13C12-HxCDD 678	82.1	82.7	79.8	98.0
13C12-HpCDF 678	72.5	73.9	72.2	69.1
13C12-HpCDD 678	102	95.9	94.7	84.4
13C12-OCDD	107	94.0	93.9	62.6

{Estimated Maximum Possible Concentration}, (Detection Limit).

TRIANGLE LABORATORIES, INC.
Sample Result Summary for Project 36062
Method 23X (DB-225)

Data File	X960512	X960513
Sample ID	COE-HG-AFTOUT-M 23-R1	COE-HG-AFTOUT-M 23-R2
Units	ng	ng
Analytes		
2378-TCDF	(0.007)	{0.01}
Internal Standards Percent Recovery Summary (% Rec)		
13C12-2378-TCDF	44.5	56.5

{Estimated Maximum Possible Concentration}, (Detection Limit).

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Roy F. Weston, Inc.

TLI Project: 36062
Client Sample: TLI M23 Blank

Method 23 PCDD/PCDF Analysis (a)
Analysis File: S961035

Client Project:	COE Hot Gas Program				
Sample Matrix:	XAD	Date Received:	/ /	Spike File:	SPX23704
TLI ID:	TLI Blank	Date Extracted:	02/07/96	ICal:	SF51256
		Date Analyzed:	02/17/96	ConCal:	S961030
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S961035	% Lipid:	n/a
GC Column:	DB-5	Analyst:	BD	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.03				—
1,2,3,7,8-PeCDD	ND	0.03				—
1,2,3,4,7,8-HxCDD	ND	0.04				—
1,2,3,6,7,8-HxCDD	ND	0.03				—
1,2,3,7,8,9-HxCDD	ND	0.03				—
1,2,3,4,6,7,8-HpCDD	ND	0.03				—
1,2,3,4,6,7,8,9-OCDD	ND	0.04				—
2,3,7,8-TCDF	ND	0.02				—
1,2,3,7,8-PeCDF	ND	0.03				—
2,3,4,7,8-PeCDF	ND	0.03				—
1,2,3,4,7,8-HxCDF	ND	0.02				—
1,2,3,6,7,8-HxCDF	ND	0.02				—
2,3,4,6,7,8-HxCDF	ND	0.02				—
1,2,3,7,8,9-HxCDF	ND	0.03				—
1,2,3,4,6,7,8-HpCDF	ND	0.02				—
1,2,3,4,7,8,9-HpCDF	ND	0.03				—
1,2,3,4,6,7,8,9-OCDF	ND	0.03				—

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	ND		0.03		—
Total PeCDD	ND		0.03		—
Total HxCDD	ND		0.03		—
Total HpCDD	ND		0.03		—
Total TCDF	ND		0.02		—
Total PeCDF	ND		0.03		—
Total HxCDF	ND		0.02		—
Total HpCDF	ND		0.03		—

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Roy F. Weston, Inc.

Method 23 PCDD/PCDF Analysis (a)
Analysis File: S961035

TLI Project: 36062
Client Sample: TLI M23 Blank

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	1.8	45.7	40%-130%	0.78	21:20	—
$^{13}C_{12}$-2,3,7,8-TCDD	2.1	53.4	40%-130%	0.79	22:06	—
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2.2	55.3	40%-130%	1.41	25:26	—
$^{13}C_{12}$-1,2,3,7,8-PeCDD	3.1	77.7	40%-130%	1.55	26:32	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2.8	70.0	40%-130%	0.49	29:05	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	3.3	82.1	40%-130%	1.23	29:47	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2.9	72.5	25%-130%	0.44	31:44	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	4.1	102	25%-130%	1.01	32:34	—
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	8.5	107	25%-130%	0.85	35:05	—

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	3.5	87.1	70%-140%		22:07	—
$^{13}C_{12}$-2,3,4,7,8-PeCDF	4.2	105	70%-140%	1.38	26:10	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.4	84.1	70%-140%	0.48	28:59	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	4.0	99.2	70%-140%	1.20	29:42	—
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.7	92.2	70%-140%	0.46	32:55	—

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	3.3	81.6	40%-130%	0.49	30:17	—
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	3.4	85.9	40%-130%	0.49	29:34	—

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.82	21:53	—
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.21	30:04	—

Data Reviewer: VC 02/21/96

X237_PSR v1.14. LARS 6.03.09

Printed: 18:44 02/21/96

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Roy F. Weston, Inc.

TLI Project: 36062 — Method 23 PCDD/PCDF Analysis (a)

Client Sample: COE-HG-AFTOUT-M23-R1 — Analysis File: S961057

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/02/96	Spike File:	SPX23704
TLI ID:	113-204-1A-E	Date Extracted:	02/07/96	ICal:	SF51256
		Date Analyzed:	02/19/96	ConCal:	S961053
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S961035	% Lipid:	n/a
GC Column:	DB-5	Analyst:	VCA	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	0.04			0.76	22:08	___
1,2,3,7,8-PeCDD	0.16			1.51	26:33	___
1,2,3,4,7,8-HxCDD	0.13			1.34	29:43	___
1,2,3,6,7,8-HxCDD	0.15			1.27	29:49	___
1,2,3,7,8,9-HxCDD	0.33			1.28	30:04	___
1,2,3,4,6,7,8-HpCDD	1.2			1.06	32:35	___
1,2,3,4,6,7,8,9-OCDD	3.1			0.85	35:06	___
2,3,7,8-TCDF	0.04			0.81	21:23	___
1,2,3,7,8-PeCDF	ND	0.02				___
2,3,4,7,8-PeCDF	ND	0.02				___
1,2,3,4,7,8-HxCDF	0.02			1.34	29:00	___
1,2,3,6,7,8-HxCDF	0.01			1.26	29:06	___
2,3,4,6,7,8-HxCDF	0.02			1.28	29:35	___
1,2,3,7,8,9-HxCDF	ND	0.01				___
1,2,3,4,6,7,8-HpCDF	0.05			1.17	31:45	___
1,2,3,4,7,8,9-HpCDF	EMPC		0.01			___
1,2,3,4,6,7,8,9-OCDF	0.08			0.97	35:13	___

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	0.84	13			___
Total PeCDD	1.9	11		1.9	___
Total HxCDD	2.6	7			___
Total HpCDD	2.8	2			___
Total TCDF	0.04	1			___
Total PeCDF	0.13	4			___
Total HxCDF	0.16	6			___
Total HpCDF	0.13	2		0.14	___

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Roy F. Weston, Inc.

TLI Project: 36062
Client Sample: COE-HG-AFTOUT-M23-R1

Method 23 PCDD/PCDF Analysis (a)
Analysis File: S961057

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	2.1	51.7	40%-130%	0.77	21:20	—
$^{13}C_{12}$-2,3,7,8-TCDD	2.3	57.6	40%-130%	0.80	22:06	—
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2.2	55.7	40%-130%	1.45	25:27	—
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2.9	72.0	40%-130%	1.51	26:32	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2.9	72.8	40%-130%	0.51	29:05	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	3.3	82.7	40%-130%	1.25	29:48	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	3.0	73.9	25%-130%	0.43	31:44	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	3.8	95.9	25%-130%	1.05	32:34	—
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	7.5	94.0	25%-130%	0.85	35:06	—

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	3.8	95.9	70%-140%		22:08	—
$^{13}C_{12}$-2,3,4,7,8-PeCDF	4.7	118	70%-140%	1.42	26:11	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.7	92.0	70%-140%	0.50	29:00	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	4.3	107	70%-140%	1.21	29:43	—
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.9	98.4	70%-140%	0.42	32:55	—

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	3.5	87.4	40%-130%	0.51	30:18	—
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	3.7	93.0	40%-130%	0.50	29:35	—

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.78	21:54	—
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.23	30:05	—

Data Reviewer: VC 02/21/96

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Roy F. Weston, Inc.

TLI Project: 36062 — Method 23 TCDD/TCDF Analysis (DB-225)

Client Sample: COE-HG-AFTOUT-M23-R1 — Analysis File: X960512

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/02/96	Spike File:	SPC2NF04
TLI ID:	113-204-1A-E	Date Extracted:	02/07/96	ICal:	XF21266
		Date Analyzed:	02/12/96	ConCal:	X960506
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S961035	% Lipid:	n/a
GC Column:	DB-225	Analyst:	MM	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	ND	0.007				—

Internal Standard	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	1.8	44.5	40%-130%	0.79	21:32	—

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	20:32	—

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Initial ....Date...

Data Review By: V 2/21/96 Calculated Noise Area: 9.45

The Total Area for each peak with an ion abundance ratio outside ratio limits has been recalculated according to method requirements.

Page No. 1 Listing of X960512B.dbf
02/21/96 Matched GC Peaks / Ratio / Ret. Time

Compound/ M_Z....	QC.Log	Omit	Why	..RT.	OK	Ratio	Total.Area...	Area.Peak.1..	Area.Peak.2..	Rel.RT	Compound.Name..	ID..
						0.65-0.89				0.675-1.186		
TCDF												
304-306		DC	NL	0:00	RO	0.90	3.16			0.000		
		DC	SN	16:49	RO	1.73	2.94			0.781		
		DC	SN	16:52	RO	0.32	1.47			0.783		
		DC	SN	17:02	RO	0.55	3.00			0.791		
		DC	SN	17:25	RO	0.48	2.58			0.809		
		DC	SN	17:56	RO	0.21	0.91			0.833		
		DC	SN	18:00	RO	1.65	2.00			0.836		
				18:10		0.80	41.95	18.58	23.37	0.844		
		DC	SN	18:17		0.74	22.22			0.849		
				18:25	RO	0.62	41.41	18.05	29.02	0.855		
		DC	SN	18:36		0.74	21.59			0.864		
		DC	SN	18:44	RO	0.06	0.55			0.870		
		DC	SN	18:52	RO	0.38	10.46			0.876		
				19:00		0.79	48.61	21.43	27.18	0.882		
		DC	SN	19:08	RO	1.49	10.30			0.889		
				19:17		0.66	82.69	32.98	49.71	0.896		
				19:28	RO	0.98	41.26	22.86	23.29	0.904		
		DC	SN	19:36		0.76	3.49			0.910		
				19:50		0.72	128.02	53.51	74.51	0.921		
				20:14		0.86	61.52	28.51	33.01	0.940		
				20:30	RO	0.63	43.53	18.99	30.00	0.952		
		DC	SN	20:39		0.71	33.81			0.959		
		DC	SN	20:54		0.81	8.48			0.971		
		DC	SN	21:02	RO	0.48	23.95			0.977		
		DC	SN	21:13	RO	0.42	3.96			0.985		
		DC	SN	21:27	RO	0.61	20.16			0.996		
		DC	SN	21:33	RO	0.51	26.10			1.001	2378-TCDF	AN
		DC	SN	21:45		0.75	39.28			1.010		
		DC	SN	22:01	RO	0.61	26.02			1.022		
				22:09		0.82	42.41	19.06	23.35	1.029		
		DC	SN	22:24	RO	1.18	2.58			1.040		
		DC	SN	22:31	RO	0.20	1.71			1.046		
		DC	SN	22:54		0.69	21.58			1.063		
		DC	SN	23:00	RO	0.39	2.92			1.068		
		DC	SN	23:04	RO	1.13	2.83			1.071		
		DC	SN	23:23	RO	0.99	1.56			1.086		
		DC	SN	23:30	RO	0.23	1.38			1.091		
		DC	SN	23:32	RO	0.19	3.04			1.093		
		DC	SN	23:36	RO	0.63	2.27			1.096		
		DC	SN	23:49	RO	1.12	0.87			1.106		
304-306			9	Peaks			531.40					

Roy F. Weston, Inc.

TLI Project: 36062 — Method 23 PCDD/PCDF Analysis (a)
Client Sample: COE-HG-AFTOUT-M23-R2 — Analysis File: S961058

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/06/96	Spike File:	SPX23704
TLI ID:	113-217-1A-E	Date Extracted:	02/07/96	ICal:	SF51256
		Date Analyzed:	02/19/96	ConCal:	S961053
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S961035	% Lipid:	n/a
GC Column:	DB-5	Analyst:	VCA	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	EMPC		0.02			
1,2,3,7,8-PeCDD	0.07			1.69	26:32	___
1,2,3,4,7,8-HxCDD	0.06			1.06	29:42	___
1,2,3,6,7,8-HxCDD	0.05			1.26	29:47	___
1,2,3,7,8,9-HxCDD	0.11			1.29	30:04	___
1,2,3,4,6,7,8-HpCDD	0.34			0.99	32:34	___
1,2,3,4,6,7,8,9-OCDD	1.1			0.87	35:05	___
2,3,7,8-TCDF	0.07			0.87	21:21	___
1,2,3,7,8-PeCDF	0.01			1.66	25:26	___
2,3,4,7,8-PeCDF	0.03			1.53	26:11	___
1,2,3,4,7,8-HxCDF	0.04			1.17	28:59	___
1,2,3,6,7,8-HxCDF	0.02			1.13	29:05	___
2,3,4,6,7,8-HxCDF	0.03			1.23	29:35	___
1,2,3,7,8,9-HxCDF	ND	0.02				___
1,2,3,4,6,7,8-HpCDF	0.08			1.14	31:44	___
1,2,3,4,7,8,9-HpCDF	0.01			1.07	32:55	___
1,2,3,4,6,7,8,9-OCDF	0.05			0.80	35:12	___

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	0.36	9		0.40	___
Total PeCDD	0.79	8		0.91	___
Total HxCDD	0.96	7			___
Total HpCDD	0.75	2			___
Total TCDF	0.14	2			___
Total PeCDF	0.28	9		0.29	___
Total HxCDF	0.20	5		0.20	___
Total HpCDF	0.16	4			___

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Roy F. Weston, Inc.

TLI Project: **36062** Method 23 TCDD/TCDF Analysis (DB-225)

Client Sample: **COE-HG-AFTOUT-M23-R2** Analysis File: **X960513**

Client Project:	**COE Hot Gas Program**				
Sample Matrix:	**M23**	Date Received:	**02/06/96**	Spike File:	**SPC2NF04**
TLI ID:	**113-217-1A-E**	Date Extracted:	**02/07/96**	ICal:	**XF21266**
		Date Analyzed:	**02/12/96**	ConCal:	**X960506**
Sample Size:	**1.000**	Dilution Factor:	**n/a**	% Moisture:	**n/a**
Dry Weight:	**n/a**	Blank File:	**S961035**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**BB**	% Solids:	**n/a**

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	EMPC		0.01			—

Internal Standard	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	2.3	56.5	40%-130%	0.80	21:32	—

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.79	20:31	—

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Roy F. Weston, Inc.

TLI Project: 36062
Client Sample: COE-HG-AFTOUT-M23-R2

Method 23 PCDD/PCDF Analysis (a)
Analysis File: S961058

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	2.1	53.6	40%-130%	0.77	21:20	—
$^{13}C_{12}$-2,3,7,8-TCDD	2.4	59.5	40%-130%	0.78	22:05	—
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2.3	58.2	40%-130%	1.49	25:26	—
$^{13}C_{12}$-1,2,3,7,8-PeCDD	3.1	76.8	40%-130%	1.55	26:32	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2.9	71.3	40%-130%	0.51	29:05	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	3.2	79.8	40%-130%	1.20	29:47	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2.9	72.2	25%-130%	0.43	31:44	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	3.8	94.7	25%-130%	1.02	32:34	—
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	7.5	93.9	25%-130%	0.86	35:05	—

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	3.8	95.0	70%-140%		22:07	—
$^{13}C_{12}$-2,3,4,7,8-PeCDF	4.6	116	70%-140%	1.53	26:10	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.6	90.4	70%-140%	0.50	28:59	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	4.2	106	70%-140%	1.23	29:42	—
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.9	98.4	70%-140%	0.42	32:55	—

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	3.5	86.4	40%-130%	0.50	30:17	—
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	3.6	89.3	40%-130%	0.51	29:34	—

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.79	21:53	—
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.21	30:04	—

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Roy F. Weston, Inc.

TLI Project: 36062 — Method 23 PCDD/PCDF Analysis (a)
Client Sample: COE-HG-AFTOUT-M23-BT — Analysis File: S961060

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/06/96	Spike File:	SPX23704
TLI ID:	113-217-3A-E	Date Extracted:	02/07/96	ICal:	SF51256
		Date Analyzed:	02/19/96	ConCal:	S961053
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	S961035	% Lipid:	n/a
GC Column:	DB-5	Analyst:	VCA	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	EMPC		0.006			—
1,2,3,7,8-PeCDD	0.02			1.73	26:35	—
1,2,3,4,7,8-HxCDD	ND	0.03				—
1,2,3,6,7,8-HxCDD	ND	0.02				—
1,2,3,7,8,9-HxCDD	ND	0.02				—
1,2,3,4,6,7,8-HpCDD	0.07			1.06	32:37	—
1,2,3,4,6,7,8,9-OCDD	EMPC		0.17			—
2,3,7,8-TCDF	ND	0.009				—
1,2,3,7,8-PeCDF	ND	0.01				—
2,3,4,7,8-PeCDF	ND	0.01				—
1,2,3,4,7,8-HxCDF	ND	0.02				—
1,2,3,6,7,8-HxCDF	ND	0.01				—
2,3,4,6,7,8-HxCDF	ND	0.02				—
1,2,3,7,8,9-HxCDF	ND	0.02				—
1,2,3,4,6,7,8-HpCDF	ND	0.02				—
1,2,3,4,7,8,9-HpCDF	ND	0.03				—
1,2,3,4,6,7,8,9-OCDF	ND	0.04				—

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	0.02	1		0.02	—
Total PeCDD	0.03	2		0.09	—
Total HxCDD	0.14	3			—
Total HpCDD	0.07	1		0.15	—
Total TCDF	ND		0.009		—
Total PeCDF	ND		0.01		—
Total HxCDF	ND		0.01		—
Total HpCDF	ND		0.02		—

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Roy F. Weston, Inc.

TLI Project: 36062
Client Sample: COE-HG-AFTOUT-M23-BT

Method 23 PCDD/PCDF Analysis (a)
Analysis File: S961060

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	3.0	74.1	40%-130%	0.77	21:23	__
$^{13}C_{12}$-2,3,7,8-TCDD	3.3	82.4	40%-130%	0.79	22:08	__
$^{13}C_{12}$-1,2,3,7,8-PeCDF	3.0	74.2	40%-130%	1.47	25:30	__
$^{13}C_{12}$-1,2,3,7,8-PeCDD	3.7	92.5	40%-130%	1.54	26:34	__
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	3.6	89.4	40%-130%	0.51	29:07	__
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	3.9	98.0	40%-130%	1.22	29:49	__
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2.8	69.1	25%-130%	0.43	31:47	__
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	3.4	84.4	25%-130%	1.01	32:37	__
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	5.0	62.6	25%-130%	0.86	35:08	__

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	3.6	89.6	70%-140%		22:10	__
$^{13}C_{12}$-2,3,4,7,8-PeCDF	4.2	105	70%-140%	1.49	26:13	__
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.8	95.0	70%-140%	0.52	29:02	__
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	4.4	111	70%-140%	1.21	29:45	__
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.6	90.4	70%-140%	0.42	32:57	__

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	3.8	96.0	40%-130%	0.51	30:20	__
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	4.0	100	40%-130%	0.50	29:37	__

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	21:57	__
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.20	30:06	__

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CASE NARRATIVE

Analysis of Samples for the Presence of

Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans by

High-Resolution Chromatography / High-Resolution Mass Spectrometry

Method 23 (6/93)

Date:	March 4, 1996
Client ID:	Roy F. Weston, Inc.
P.O. Number:	
TLI Project Number:	36062r1

Rev. 06/02/95

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Overview

Two M23 samples were received from Roy F. Weston, Inc. on February 02, 1996 at 11 °C under TLI project number 36049. Three more M23 samples were received on February 06, 1996 at 4°C. All samples were received in good condition and were stored in a refrigerator at 4°C until the time of extraction. The archived portion of sample COE-HG-AFTOUT-M23-R3 was fractionated due to poor internal standard recoveries in the initial analysis of the sample. Only results for this sample are included in this data package.

The sample and associated QC sample were extracted and analyzed according to procedures described in the Triangle Laboratories' Data User's Manual (Rev. 12/92-HK-2-AH-2/93). Any particular difficulties encountered during the samples' handling by Triangle Laboratories will be discussed in the QC Remarks section below. Results reported relate only to the items tested.

Quality Control Samples

A laboratory method blank, identified as the TLI M23 Blank, was prepared along with the samples.

Quality Control Remarks

This release of this particular set of Roy F. Weston, Inc. analytical data by Triangle Laboratories was authorized by the Quality Control Chemist who has reviewed each sample data package individually following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effect of these deviations upon the validity and reliability of the results. Please consult Triangle Laboratories' Data User's Manual for further details. Specific QC issues associated with this particular project are:

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review: None

Other Comments: Any analytes found in the TLI M23 Blank are detected at a level equal to or less than the Target Detection Limit. This level of contamination is acceptable as per TLI guidelines. OCDD is not subject to blank contamination criteria as per TLI guidelines.

Sample Calculations:

Analyte Concentration

The amount of any analyte is calculated using the following expression.

$$Amt_{(\sigma)} = \frac{A_\sigma * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

$Amt_{(\sigma)}$ is the amount of a given analyte,

A_σ is the integrated current for the characteristic ions of the analyte,

A_β is the integrated current of the characteristic ions of the corresponding internal standard,

Q_β represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume (W = 1 for M23)

The amount is expressed in nanograms (ng) or picograms (pg).

Detection Limits

The detection limit reported for a target analyte that is not detected or presents an analyte response that is less than 2.5 times the background level is calculated by using the following expression. The area of the analyte is replaced by the noise level measured in a region of the chromatogram clear of genuine GC signals multiplied by an empirically determined factor. The detection limits represent the maximum possible concentration of a target analyte that could be present without being detected.

$$DL_{(\sigma)} = \frac{2 * 2.5 * (F * H) * Q_\beta}{A_\beta * RRF_{(\sigma)} * W}$$

Where:

$DL_{(\sigma)}$ is the estimated detection limit for a target analyte,

2.5 is the minimum response required for a GC signal,

F is an empirical number that approximates the area to height ratio for a GC signal. This number is 5 for the DB-5 GC column and 3.5 for the DB-225 GC column,

H is the height of the noise

A_β is the integrated current of the characteristic ions of the corresponding internal standard,

Q_β represents the amount of internal standard added to the sample before extraction,

$RRF_{(\sigma)}$ is the mean analyte relative response factor from the initial calibration (ICal) and,

W is the sample weight or volume

The detection limit is expressed in nanograms (ng) or picograms (pg).

Other sample calculations may be found in the Triangle Laboratories Data User's Manual.

Data Flags

In order to assist with data interpretation, data qualifier flags are used on the final reports, as discussed in Triangle Laboratories' Method 23 Data User's Manual. Please note that all data qualifier flags are subjective and are applied as consistently as possible. Each flag has been reviewed by two independent Chemists and the impact of the data qualifier flag on the quality of the data discussed above. The most commonly used flags are:

A **'B'** flag is used to indicate that an analyte has been detected in the laboratory method blank as well as in an associated field sample. The 'B' flag will be used only when the concentration of analyte found in the sample is less than 20 times that found in the associated blank. This flag denotes possible contribution of background laboratory contamination to the concentration or amount of that analyte detected in the field sample. Under Triangle Laboratories guidelines, a laboratory blank is acceptable if the tetra- through hepta-CDD/CDF levels are all below the target detection limits (TDLS) or if the contamination levels are less than 5% of the levels detected in the associated field samples. If these conditions are satisfied or if the blank is unable to be reextracted, the interpretation of the contamination levels relative to the samples should be as follows: 1) analyte quantitations should be considered valid if the level of blank contamination is less than five percent of the level detected in the field sample, 2) analyte quantitations should be considered estimated if the analyte level in the sample is five to twenty times the level of the analyte in the blank, or 3) analytes whose level in a sample is the same as or less

than five times the level detected in the associated blank should be considered present likely due to laboratory contamination and not native to the sample.

An **'E'** flag is used to indicate that an PCDF peak has eluted at the sample time as the associated diphenyl ether (DPE) and that the DPE peak intensity is ten percent or more of the PCDF peak intensity. Total PCDF values are flagged 'E' if the total DPE contribution to the total PCDF value is greater than ten percent. All PCDF peaks that are significantly influenced by the presence of DPE peaks are quantitated with EMPC values, regardless of the isotopic abundance ratio. These EMPC values are most likely overestimated due to the DPE contribution to the peak area.

An **'I'** flag is used to indicate labeled standards have been interfered with on the GC column by coeluting, interferent peaks. The interference may have caused the standard's area to be overestimated. All quantitations relative to this standard, therefore, may be underestimated.

A **'PR'** flag is used to indicate that a GC peak is poorly resolved. This resolution problem may be seen as two closely eluting peaks without a reasonable valley between the peak tops, overly broad peaks, or peaks whose shapes vary greatly from a normal distribution. The concentrations or amounts reported for such peaks are most likely overestimated.

A **'Q'** flag is used to indicate the presence of QC ion instabilities caused by quantitative interferences. Affected analytes may be overestimated or underestimated as a result of this interference. A peak is flagged 'Q' only if it is affected by a QC ion deviation greater than 20% full scale as determined relative to the labeled standard against which it is quantitated. Total PCDF/PCDF quantitations will be flagged 'Q' if the interferences affect ten percent or more of the total PCDD/PCDF peak areas.

An **'RO'** flag is used to indicate that a labeled standard has an ion abundance ratio that is outside of the acceptable QC limits, most likely due to a coeluting interference. This may have caused the percent recovery of the standard to be overestimated. All quantitations versus this standard, therefore, may be underestimated.

A **'U'** flag is used to indicate that a specific (2,3,7,8-substituted) isomer cannot be resolved from a large, coeluting interferent GC peak. The specific isomer is reported as not detected as a valid concentration/amount cannot be determined. The calculated detection limit, therefore, should be considered an underestimated value.

A **'V'** flag is used to indicate that, although the percent recovery of a labeled standard may be below a specific QC limit, the signal-to-noise ratio of the peak is greater than ten-to-one. The standard is considered reliably quantifiable. All quantitations derived from the standard are considered valid as well.

By our interpretation, the analytical data in this project are valid based on the guidelines of EPA Method 23 (6/93) and Triangle Laboratories' Method 23 Data User's Manual. Any specific QC concerns or problems have been discussed in the QC Remarks section of this case narrative with emphasis on their effect on the data. Should Roy F. Weston, Inc. have any questions or comments regarding this data package, please feel free to contact our Project Scientist, Selena Armistead, at 919/544-5729 ext. 268.

For Triangle Laboratories, Inc.,

Report Preparation	Quality Control	
Sheila A. Lee-Lewis	Bracha Rosenberg	3.5.96
	BRACHA ROSENBERG	
Sheila A. Lee-Lewis Report Preparation Chemist	Report Preparation Chemist	

The total number of pages in the data package is : 102 .

TRIANGLE LABS

DOCUMENT CONTROL

Triangle Laboratories, Inc.
801 Capitola Drive
Durham, NC 27713-4411
919-544-5729
P.O. Box 13485
Research Triangle Park, NC 27709-3485
Fax # 919-544-5491

WESTON Analytics Use Only

Custody Transfer Record/Lab Work Request

WESTON

Page ___ of ___

Client [illegible]
Est. Final Proj. Sampling Date
Work Order # [illegible]
Project Contact/Phone # [illegible]
AD Project Manager [illegible]
QC [illegible] Del [illegible] TAT
Date Rec'd ___ Date Due ___
Account # ___

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED →

ORGANIC: VOA | BNA | Pest/PCB | Herb
INORG: Metal | CN

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Metal	CN
	[illegible]	[illegible]	[illegible]		[illegible]					X		
	[illegible]	[illegible]	[illegible]							X		
	[illegible]	[illegible]	[illegible]							X		
	[illegible]	[illegible]	[illegible]							X		
	[illegible]	[illegible]	[illegible]							X		

[illegible] 3

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

Custody Seal : Present/Intact Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Present	TLI Project Number: 36062	Book 113
		Client: RFW01 — Roy F. Weston, Inc.	
		Date Received: 02/06/96 By	Page 217
Ice Chest ICE	Temp 4.0 C	Carrier and Number: FedEx/	

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-1A	COE-HG-AFTOUT-M23-R2-C01	FILTER	2/07 HC sbm	Empty						
113-217-1B	COE-HG-AFTOUT-M23-R2-C01	XAD								
113-217-1C	COE-HG-AFTOUT-M23-R2-C01	FH/RINSE								
113-217-1D	COE-HG-AFTOUT-M23-R2-C01	BH/RINSE								
113-217-1E	COE-HG-AFTOUT-M23-R2-C01	TOLUENE								
113-217-2A	COE-HG-AFTOUT-M23-R3-C01	FILTER								
113-217-2B	COE-HG-AFTOUT-M23-R3-C01	XAD								
113-217-2C	COE-HG-AFTOUT-M23-R3-C01	FH/RINSE								
113-217-2D	COE-HG-AFTOUT-M23-R3-C01	BH/RINSE								
113-217-2E	COE-HG-AFTOUT-M23-R3-C01	TOLUENE								

Receiving Remarks:

Archive Remarks:

Custody Seal : Present/Intact Chain of Custody : Present Sample Tags : Present Sample Tag Numbers: Listed SMO Forms : N/A	Sample Seals: Present	TLI Project Number ¦ 36062	Book
		Client: RFW01 ¦ Roy F. Weston, Inc.	113
		Date Received ¦ 02/06/96 ¦ By [signature]	Page
Ice Chest ICE	Temp 4.0 C	Carrier and Number ¦ FedEx/	217

TLI Number mR/H:CPM	Client ID	Matrix Location	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init
113-217-3A	COE-HG-AFTOUT-M23-BT-C01	FILTER	2/07/96 Sbm	Empty						
113-217-3B	COE-HG-AFTOUT-M23-BT-C01	XAD								
113-217-3C	COE-HG-AFTOUT-M23-BT-C01	FH/RINSE								
113-217-3D	COE-HG-AFTOUT-M23-BT-C01	BH/RINSE								
113-217-3E	COE-HG-AFTOUT-M23-BT-C01	TOLUENE								

Receiving Remarks:

10

Archive Remarks:

TRIANGLE LABORATORIES, INC.
SAMPLE TRACKING AND PROJECT MANAGEMENT FORM

---ADMINISTRATIVE INFORMATION---

TLI Proj#: 36062-r1
Prod Code: D23451
DetectLim: .05 ng

Samples: 2
Matrix.: M23
Type...: A

TurnAround.: 21 Day(s)
Hold Time..: 0 Day(s)
Date Recvd.: 02/06/96
Date Due...: 02/27/96
DWL Due Dt.: 02/16/96

Analyte List.: Tetra-Octa PCDDs/PCDFs

Method.......: Method 23: T-O, Toluene Combined
Client Proj..: COE Hot Gas Program
Client.......: Roy F. Weston, Inc. (RFW01)
P.O. No......:
Contact......: Jeff O'Neill
Proj. Mgr....: Selena Armistead

Collect Dt/Tm: 02/02/96
Phone........: 610-701-7201
Fax..........: 610-701-3187
Sample Origin:

---SPECIAL INSTRUCTIONS / QA REQUIREMENTS---

Prep Project: 02518

Prespike Standard: USF-C and USF-S
Prespike Amount..: 4.0ng

---REPORTING REQUIREMENTS---

Reporting Format: Report Option II

See MILES for Instructions/Communications.

Completed by: Selena Armistead DATE: 2/20/96

Reviewed by: SA DATE: ________ (PMGT0395)

**** Log: C *** Desc: Cleanup archived portion *** Ext:[ ]
**** By: Armistead on 02/20/96 at 17:43:15

Sample 113-217-2A-E has extremely poor internal standard recoveries which are not meeting 10:1 signal to noise criteria. Please take the archived portion of the sample and subject it to cleanup procedures and analysis.

EMail sent to: Ragsdale

TRIANGLE LABORATORIES, INC.

PCDD/PCDF/PBDD/PBDF Sample Preparation Tracking & Management Form

Client: Roy F. Weston, Inc. (RFW01)

Project: 36062

Method: Method 23: T-O, Toluene Combined

Sample Information:

Extraction Date: 2/07/96

Spiking Dates: 2/07/96 2/8/96 _/_/_ _/_/_

SBm SBm

WL Spike: 40 µl, conc: 0.100 ng/µl

S#.crd	TLI SAMPLE ID / CLIENT SAMPLE ID	GROSS WEIGHT Before	After	SAMPLE SIZE g / ml	USF-I Ex/Cl Initials 40µl	USF-A Ex/Cl Initials 40µl	MISC Ex/Cl Initials	USFMX Extr. Initials	Sample Left ? Yes/No
000	TLI Blank / TLI M23 Blank			1					Y/2
001	113-204-1A-E / COE-HG-AFTOUT-M23-R1			1					Y/2
002	113-217-1A-E / COE-HG-AFTOUT-M23-R2			1					Y/2
003	113-217-2A-E / COE-HG-AFTOUT-M23-R3			1					Y/2
004	113-217-3A-E / COE-HG-AFTOUT-M23-BT			1					Y/2
005	113-204-2A-D / COE-HG-OUT-M23-SB			1					Y/2

Gross weight of sample container + sample before/after aliquot removal

005 Extract and HOLD

COMMENTS:

Initial/Date SBm 2/07/96

Indicate below the TLI Identification Number of the Sample Fortification Solutions:

USF-AIS: _____

USF-I: 3345G 0.1ug/ml Exp. 11/26/96

USF-A: 3496 Exp 11/1/96 0.1ug/ml

USF-ACS: _____ USF-MX: _____

USF-C: _____ Other: _____

LOT # (Solvents): Toluene 950743

for extraction: _____

INITIALS OF BOTH THE SPIKER AND OBSERVER MUST BE ENTERED.

(XXXXX = Gross Weight not provided for WATER Samples.)

TRIANGLE LABORATORIES, INC.
SAMPLE EXTRACTION and CLEANUP TRACKING FORM
TLI Project: 36062

Ext S#.crd and TLI Number	EXTRACTION: Spike before Extr. ✓	Extr. ✓	Spike after Extr. ✓	CHROMATOGRAPHIC CLEANUP: Acid Base	Big Fish	Escltd Silica Gel ✓	Acid Almina 6 gm ✓	Flor-isil	Carbon Column ✓	Trans-fer ✓	Add'l Clean-up
000 TLI Blank	SBM SDD 2/07/96	SBM 2/07/96	SBM JDD					DSP 2/8		2/10/96	
001 113-204-1A-E											
002 113-217-1A-E											
X 003 113-217-2A-E											
004 113-217-3A-E											
005 113-204-2A-D			2-8-96					SBM 2/9/96		JS	

...PROCEDURE....	......DETAILS......	Performed.By	Observed.By	....DATE....
Spike		SBM	JDD	2/07/96
Soxhelet Ext.		SBM		2/07/96
Rotovap	40mL, 10mL, Dryness	JDD		2/8/96
Combine		N/A		/ /
Divide 50:50		JDD		2/8/96
Solvent Exchange				/ /
Add Tridecane		*JDD ~~JDD~~		2/8/96

Comments Tridecane needs to be added after extraction
*Tridecane was Added JDD 2-8-96

Rev 01/25/96 (PSTMF 4)

TRIANGLE LABORATORIES, INC.
SAMPLE EXTRACTION and CLEANUP TRACKING FORM
TLI Project: 36062 r1

Ext S#.crd and TLI Number	EXTRACTION: Spike before Extr.	Extr.	Spike after Extr.	CHROMATOGRAPHIC CLEANUP: Acid Base	Big Fish	Escltd Silica Gel	Acid Almina 6 gm	Flor-isil	Carbon Column	Trans-fer	Add'l Clean-up
r1 000 TLI Blank										JOB 2/22/96	
r1 003 113-217-2A-E											
r1 0031 113-217-2A-E							JGr 2/21/96 MH				

...PROCEDURE....	......DETAILS......	Performed.By	Observed.By	....DATE....
Spike BEFORE Ext				__ / __ / __
Extraction	Soxhlet / Jar			__ / __ / __
Spike AFTER Ext				__ / __ / __
Add Tridecane		L.B.		2 / 21 / 96
Rotovap	40mL, 10mL, Dryness	J.Lewis		2 / 21 / 96
Combine				__ / __ / __
Divide				__ / __ / __
Solvent Exchange		J.Lewis		2 / 21 / 96

Comments

Rev 02/08/96 (PSTMF 4)

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 36062-r1

Transfer From: DWLH5 To: DMS5

	Initials..	Date.......	Time...
Released by:	ADH	02/22/96	13:02
Accepted by:	VM	2/22/96	15:37

MILES.ID........	TLI_No......	Cust.Id..................
36062-r1 -000	TLI Blank	TLI M23 Blank
36062-r1 -003	113-217-2A-E	COE-HG-AFTOUT-M23-R3
~~36062-r1 -0031~~	~~113-217-2A-E~~	~~COE-HG-AFTOUT-M23-R3~~

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TRIANGLE LABORATORIES, INC.
HR GC/HRMS ANALYSIS

Method: Method 23: T-O, Toluene Combined
Required Detection Limit: .05 ng

PROJECT: 36062r1

SAMPLE INFORMATION

RS Conc
20 µl @ 0.1 NG/µl

S#.crd	TLI SAMPLE ID / CLIENT SAMPLE ID	GC/MS FILENAME (1ST COLUMN) COLUMN: DB5	CONFIRM	CONFIRM FILENAME (2ND COLUMN) COLUMN: DB225	USF-RS VOLUME SOLN ID	USF-RS INIT. DATE	ANALYSIS COMMENTS
r1 000	TLI Blank / TLI M23 Blank	W018202 ~~W014616~~	NO	—	20 µl 3370N	LP 2/24/96	
r1 003	113-217-2A-E / COE-HG-AFTOUT-M23-R3	~~W014617~~ W018203	Yes				
~~r1 0031~~	~~113-217-2A-E / COE-HG-AFTOUT-M23-R3~~				NOT SUBMITTED LP 2/24/96		

Comments:

Type: A

Spike File: SPX23704

Amt of Extract: 50%

REV 03/07/95 (PSTMF 6)

TRIANGLE LABORATORIES INC
RUN LOG

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
V6700	DAS 60m 0.25u	5906453	@TCPKG	TOL	2.0ul	Epcus	Epcus

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332:	OP INIT	P	Q	SYR #	FILE #
2/29/96	10:16	—	3499P	—	Rizhk (Prescalibration points)	(A+E)	13%	VA	✓	✓	MPO	W0180-01
	11:00	—	3499C	—	Sensitivity Concal (NU)	(final T-2) (mv 4.3)	1.9 ET	VA	✓	✓		-02
	12:15	36158A	Mobile	11	Additional cleanup blank	⊕ (mis Rs) Redo	5.3 ET	VA	—	—		W0181-01
	12:55	36158A	LCS	10	LCS Dup	(Sample Dry) (mv 3.9)		VA	—			-02
	13:35		114-63.1ABD	1	H. Scan-A-mms-R1	(Cskdil) (mv 4.0)	1.5 ET	VA	✓	✓		-03
	14:15		114-63.2ABD	2	H. Scan-A-mms-R2		1.3 ET		✓	✓		-04
	14:55		.3ABD	3	H. Scan-A-mms-R3		1.6 ET		✓	✓		-05
	15:35		.5ABD	5	H. Scan-B-mms-R1		1.6 ET		✓	✓		-06
	16:14		.6ABD	6	- R2		1.6 ET		✓	✓		-07
	16:56		.7ABD	7	- R3		1.4 ET		✓	✓		-08
	17:36		Mobile	11	Pre Additional cleanup blank	⊕ (mv 4.3)	3.1 ET		✓	✓		-09
	18:16		LCSDup	10	LCS Dup	MZ3	3.7 E6	VA	✓	✓		-10
	18:59	36158H	LCSD	10	LCS DUP	NOT USED	4.2 E6	DS	—		Auto	W0182-01
	19:39	36062r1	—	D	TZI MZ3 Blk		3.8 E7		✓	✓		-02
	20:19		113217-2AA	3	COE-M-AFTAIT-MZ3	K3	4.6 E7		✓	✓		-03

Cond due, 23:00

PAGE #	111	1.9	

TRIANGLE LABORATORIES INC

RUN LOG

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
VG λ	DB225 30M 0.25μ	5723016	(a) TLEPKD	TT1	2.0 λ	XCONF_TT	XCONF_TT

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332	OP INIT	P	Q	SYR #	FILE #
2/29/96	12:03	—	3499E	-	RTCHK	Good	16%	VM	✓	✓	RTCHK	X960732
↓	12:49	—	3474	A	Tetra Cal 5.0		1.0 E8	VM	✓	✓	Tetra 5	X960733
↓	13:36	—	3370N	-	RS100		5.3 E7	VM	✓	✓	RS100	X960734
↓	14:22	36022B	TLE Blank	0	TLE Soil Blank		5.0 E7	VM	✓	✓	X2281	X960735
↓		36022B	113-177-7	7	TS121995WLSD01			VM			X2281	X960736
~~↓~~	~~—~~	~~36022B~~	~~113-177-10~~	~~9~~	~~TS121995NO2FS01~~	EE VM 2/29/96		VM			X2281	X960737
↓	15:10	36022B		9	TS121995NO2FS01		7.7 E7	VM	✓	✓	X2281	X960736
↓	15:56	36022B		7	TS121995WLSD01		5.5 E7	VM	✓	✓	X2281	X960737
2/29/96	1701	36160	—	Ø	T4 M23 Blank	M23	5.3 E7	[illegible]	✓	✓	X2281	X960738
2/29/96	1746	36160	114-65-4A-DE	1	7648=M23/0010-Stock	-F. Blk	6.8 E7	[illegible]	✓	✓	X2281	X960739
2/29/96	1841	36160	114-65-1A-DE	2	↓	-R1	4.3 E7	[illegible]	✓	✓	X2281	X960740
2/29/96	1926	36160	114-65-2A-DE	3		-R2	5.6 E7	[illegible]	✓	✓	X2281	X960741
2/29/96	2011	36160	114-65-3A-DE	4	↓	-R3	4.5 E7	[illegible]	✓	✓	X2281	X960742
2/29/96	2056	36239	114-164-1A	1	1-8-M23-2		4.2 E7	[illegible]	✓	✓	X2281	X960743
2/29/96	2141	36239	↓ 2A-E	2	↓ -3	V	5.3 E7	[illegible]	✓	✓	X2281	X960744

PAGE #		

TRIANGLE [illegible]RATORIES INC
RUN LOG

MS#	COLUMN TYPE	COLUMN #	PLOT NAME	PKD	AMOUNT INJ	ACQUISISTION	G/C
VGX	DB225	5723016	2TtiPkT →	→	2.0 µl	XCONF_TT →	→

DATE	TIME	PROJECT#	SAMPLE#	No	CLIENT SAMPLE ID	COMMENTS	332:	OP INIT	P	Q	SYR #	FILE #
2/29/96	2225	36239	116-144-3A-B	3	1-$-M23-4		5.5 E7	JB	✓	✓	V2281	Y960745
2/29/96	2311	36062r1	113-213-2A-B	3	COE-NG-AFTOUT-M23-R3		9.0 E7	JB	✓	✓	V2281	X960746
2/29/96		36158A	116-63-1ABD	1	N.$CEN-A-MMS-R1	(5x Dilution)		JB			V2281	X960747

PAGE #	1 :	

02:49

SAMPLE DATA

TRIANGLE LABORATORIES, INC.
Sample Result Summary for Project 36062r1
Method 23X Full Screen Analyses (DB-5)

Data File	W018202	W018203	
Sample ID	TLI M23 Blank	COE-HG-AFTOUT-M23-R3	
Units	ng	ng	
Analytes			
2378-TCDD	(0.008)	0.02	
12378-PeCDD	(0.01)	0.11	
123478-HxCDD	(0.01)	0.06	
123678-HxCDD	(0.01)	0.07	
123789-HxCDD	(0.01)	0.18	
1234678-HpCDD	(0.01)	0.73	
OCDD	0.06	2.0	
2378-TCDF	(0.006)	0.06	
12378-PeCDF	(0.01)	{0.02}	
23478-PeCDF	(0.008)	{0.02}	
123478-HxCDF	(0.008)	0.06	
123678-HxCDF	(0.006)	0.03	
234678-HxCDF	{0.008}	0.03	B
123789-HxCDF	(0.009)	(0.01)	
1234678-HpCDF	(0.007)	0.10	
1234789-HpCDF	(0.01)	0.02	
OCDF	0.01	0.05	B
TOTAL TCDD	(0.008)	0.26	
TOTAL PeCDD	(0.01)	1.3	
TOTAL HxCDD	(0.01)	1.4	
TOTAL HpCDD	(0.01)	1.9	
TOTAL TCDF	(0.006)	0.35	
TOTAL PeCDF	(0.009)	0.32	
TOTAL HxCDF	{0.008}	0.28	
TOTAL HpCDF	(0.008)	0.18	
Other Standards Percent Recovery Summary (% Rec)			
37Cl-TCDD	96.2	101	
13C12-PeCDF 234	91.4	92.2	
13C12-HxCDF 478	84.2	89.9	
13C12-HxCDD 478	92.6	90.5	
13C12-HpCDF 789	89.3	90.9	
Other Standards Percent Recovery Summary (% Rec)			
13C12-HxCDF 789	80.6	66.4	
13C12-HxCDF 234	81.4	65.5	
Internal Standards Percent Recovery Summary (% Rec)			
13C12-2378-TCDF	64.2	60.2	
13C12-2378-TCDD	68.2	60.9	
13C12-PeCDF 123	55.0	49.8	
13C12-PeCDD 123	65.3	57.7	
13C12-HxCDF 678	69.5	59.6	
13C12-HxCDD 678	86.3	73.2	
13C12-HpCDF 678	57.3	51.3	
13C12-HpCDD 678	76.0	63.9	
13C12-OCDD	67.4	56.4	

{Estimated Maximum Possible Concentration}, (Detection Limit).

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TRIANGLE LABORATORIES, INC.
Sample Result Summary for Project 36062r1
Method 23X (DB-225)

Data File	X960746
Sample ID	COE-HG-AFTOUT-M23-R3
Units	ng
Analytes	
2378-TCDF	0.01
Internal Standards Percent Recovery Summary (% Rec)	
13C12-2378-TCDF	43.7

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Roy F. Weston, Inc.

TLI Project: **36062r1** — Method 23 PCDD/PCDF Analysis (a)
Client Sample: **TLI M23 Blank** — Analysis File: **W018202**

Client Project:	n/a				
Sample Matrix:	XAD	Date Received:	/ /	Spike File:	SPX23704
TLI ID:	TLI Blank	Date Extracted:	02/07/96	ICal:	WF52246
		Date Analyzed:	02/29/96	ConCal:	W018002
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	W018202	% Lipid:	n/a
GC Column:	DB-5	Analyst:	DB	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.008				—
1,2,3,7,8-PeCDD	ND	0.01				—
1,2,3,4,7,8-HxCDD	ND	0.01				—
1,2,3,6,7,8-HxCDD	ND	0.01				—
1,2,3,7,8,9-HxCDD	ND	0.01				—
1,2,3,4,6,7,8-HpCDD	ND	0.01				—
1,2,3,4,6,7,8,9-OCDD	0.06			0.83	34:21	—
2,3,7,8-TCDF	ND	0.006				—
1,2,3,7,8-PeCDF	ND	0.01				—
2,3,4,7,8-PeCDF	ND	0.008				—
1,2,3,4,7,8-HxCDF	ND	0.008				—
1,2,3,6,7,8-HxCDF	ND	0.006				—
2,3,4,6,7,8-HxCDF	EMPC		0.008			—
1,2,3,7,8,9-HxCDF	ND	0.009				—
1,2,3,4,6,7,8-HpCDF	ND	0.007				—
1,2,3,4,7,8,9-HpCDF	ND	0.01				—
1,2,3,4,6,7,8,9-OCDF	0.01			0.88	34:27	—

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	ND		0.008		—
Total PeCDD	ND		0.01		—
Total HxCDD	ND		0.01		—
Total HpCDD	ND		0.01		—
Total TCDF	ND		0.006		—
Total PeCDF	ND		0.009		—
Total HxCDF	EMPC			0.008	—
Total HpCDF	ND		0.008		—

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Roy F. Weston, Inc.

TLI Project: 36062r1
Client Sample: TLI M23 Blank

Method 23 PCDD/PCDF Analysis (a)
Analysis File: W018202

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	2.6	64.2	40%-130%	0.77	20:17	—
$^{13}C_{12}$-2,3,7,8-TCDD	2.7	68.2	40%-130%	0.80	21:06	—
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2.2	55.0	40%-130%	1.54	24:36	—
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2.6	65.3	40%-130%	1.49	25:43	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2.8	69.5	40%-130%	0.50	28:22	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	3.5	86.3	40%-130%	1.26	29:05	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2.3	57.3	25%-130%	0.43	31:04	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	3.0	76.0	25%-130%	1.08	31:55	—
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	5.4	67.4	25%-130%	0.87	34:21	—

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	3.8	96.2	70%-140%		21:07	—
$^{13}C_{12}$-2,3,4,7,8-PeCDF	3.7	91.4	70%-140%	1.48	25:21	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.4	84.2	70%-140%	0.51	28:16	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	3.7	92.6	70%-140%	1.22	29:00	—
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.6	89.3	70%-140%	0.41	32:16	—

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	3.2	80.6	40%-130%	0.50	29:35	—
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	3.3	81.4	40%-130%	0.51	28:52	—

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.82	20:54	—
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.27	29:22	—

Data Reviewer: Shu-Lewis 03/04/96

X237_PSR v1.14, LARS 6.03.09

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	Initial	...Date...		
Data Review By:	Sa	3/4/96	Calculated Noise Area:	21.60

The Total Area for each peak with an ion abundance ratio outside ratio limits has been recalculated according to method requirements.

Page No. 1 — Listing of W018202B.dbf
03/04/96 — Matched GC Peaks / Ratio / Ret. Time

Compound/ M_Z....	QC.Log	Omit	Why	..RT.	OK	Ratio	Total.Area...	Area.Peak.1..	Area.Peak.2..	Rel.RT	Compound.Name..	ID..
13C12-TCDF						0.65-0.89				0.951-1.049		
316-318		DC	NL	0:00	RO	1.19	43.39			0.000		
		DC	WL	18:38		0.75	14.95			0.919		
		DC	WL	18:43	RO	0.23	8.78			0.923		
		DC	WL	19:05		0.72	1,758.32			0.941		
				19:48	RO	0.42	171.27	74.58	177.33	0.976		
				20:17		0.77	27,434.70	11,907.90	15,526.80	1.000	13C12-2378-TCDF	ISO
				20:47		0.84	317.08	144.40	172.68	1.025		
		DC	WH	22:11	RO	0.35	44.58			1.094		
316-318			3	Peaks			27,923.05					

---------------------- Above: TCDF / TCDD Follows ----------------------

Compound/ M_Z....	QC.Log	Omit	Why	..RT.	OK	Ratio	Total.Area...	Area.Peak.1..	Area.Peak.2..	Rel.RT	Compound.Name..	ID..
TCDD						0.65-0.89				0.858-1.062		
320-322		DC	NL	0:00		0.78	34.26			0.000		
		DC	SN	18:35		0.89	10.32			0.881		
		DC	SN	20:51		0.76	8.67			0.988		
		DC	SN	21:09	RO	0.60	8.41			1.002	2378-TCDD	AN
		DC	SN	21:12		0.79	7.36			1.005		
		DC	SN	21:18	RO	0.39	6.43			1.009		
320-322			0	Peaks			0.00					
37Cl-TCDD										0.905-1.095		
328		DC	NL	0:00			13.59			0.000		
		DC	SN	19:53			12.19			0.942		
				21:07			21,687.00	21,687.00		1.001	37Cl-TCDD	SUR1
				21:16			97.81	97.81		1.008		
				21:21			25.99	25.99		1.012		
		DC	SN	21:24			23.04			1.014		
328			3	Peaks			21,810.80					
13C12-TCDD						0.65-0.89				0.905-1.095		
332-334		DC	NL	0:00	RO	2.23	38.82			0.000		
		DC	SN	19:45	RO	0.26	57.33			0.936		
				20:54		0.82	33,623.70	15,149.50	18,474.20	0.991	13C12-1234-TCDD	RS1
				21:06		0.80	23,624.50	10,514.50	13,110.00	1.000	13C12-2378-TCDD	IS1
				21:16	RO	2.15	67.50	81.99	38.14	1.008		
		DC	SN	21:22	RO	2.44	21.55			1.013		
				21:27		0.68	349.49	141.00	208.49	1.017		
332-334			4	Peaks			57,665.19					

---------------------- Above: TCDD / PeCDF Follows ----------------------

Roy F. Weston, Inc.

TLI Project: **36062r1** — Method 23 PCDD/PCDF Analysis (a)

Client Sample: **COE-HG-AFTOUT-M23-R3** — Analysis File: **W018203**

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/06/96	Spike File:	SPX23704
TLI ID:	113-217-2A-E	Date Extracted:	02/07/96	ICal:	WF52246
		Date Analyzed:	02/29/96	ConCal:	W018002
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	W018202	% Lipid:	n/a
GC Column:	DB-5	Analyst:	DB	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	0.02			0.79	21:07	—
1,2,3,7,8-PeCDD	0.11			1.46	25:44	—
1,2,3,4,7,8-HxCDD	0.06			1.11	29:01	—
1,2,3,6,7,8-HxCDD	0.07			1.08	29:06	—
1,2,3,7,8,9-HxCDD	0.18			1.27	29:23	PR
1,2,3,4,6,7,8-HpCDD	0.73			1.02	31:55	—
1,2,3,4,6,7,8,9-OCDD	2.0			0.89	34:21	—
2,3,7,8-TCDF	0.06			0.66	20:20	—
1,2,3,7,8-PeCDF	EMPC		0.02			—
2,3,4,7,8-PeCDF	EMPC		0.02			—
1,2,3,4,7,8-HxCDF	0.06			1.05	28:15	PR
1,2,3,6,7,8-HxCDF	0.03			1.12	28:22	—
2,3,4,6,7,8-HxCDF	0.03			1.34	28:52	B, PR
1,2,3,7,8,9-HxCDF	ND	0.01				—
1,2,3,4,6,7,8-HpCDF	0.10			0.96	31:05	—
1,2,3,4,7,8,9-HpCDF	0.02			0.93	32:17	—
1,2,3,4,6,7,8,9-OCDF	0.05			0.83	34:29	B__

Totals	Amt. (ng)	Number	DL	EMPC	Flags
Total TCDD	0.26	7		0.42	—
Total PeCDD	1.3	11		1.3	—
Total HxCDD	1.4	7			—
Total HpCDD	1.9	2			—
Total TCDF	0.35	9			—
Total PeCDF	0.32	8		0.38	—
Total HxCDF	0.28	8		0.30	—
Total HpCDF	0.18	4			—

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Roy F. Weston, Inc.

TLI Project: **36062r1**
Client Sample: COE-HG-AFTOUT-M23-R3

Method 23 PCDD/PCDF Analysis (a)
Analysis File: **W018203**

Internal Standards	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	2.4	60.2	40%-130%	0.76	20:17	—
$^{13}C_{12}$-2,3,7,8-TCDD	2.4	60.9	40%-130%	0.80	21:06	—
$^{13}C_{12}$-1,2,3,7,8-PeCDF	2.0	49.8	40%-130%	1.51	24:36	—
$^{13}C_{12}$-1,2,3,7,8-PeCDD	2.3	57.7	40%-130%	1.56	25:43	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	2.4	59.6	40%-130%	0.50	28:21	—
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	2.9	73.2	40%-130%	1.20	29:05	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	2.1	51.3	25%-130%	0.42	31:04	—
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2.6	63.9	25%-130%	1.06	31:55	—
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	4.5	56.4	25%-130%	0.87	34:21	—

Surrogate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	4.0	101	70%-140%		21:07	—
$^{13}C_{12}$-2,3,4,7,8-PeCDF	3.7	92.2	70%-140%	1.51	25:21	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	3.6	89.9	70%-140%	0.50	28:15	—
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	3.6	90.5	70%-140%	1.23	29:00	—
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	3.6	90.9	70%-140%	0.40	32:15	—

Alternate Standards (Type A)	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	2.7	66.4	40%-130%	0.47	29:35	—
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	2.6	65.5	40%-130%	0.50	28:53	—

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	20:54	—
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.21	29:23	—

Data Reviewer: Slu-Lewis 03/04/96

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Roy F. Weston, Inc.

TLI Project: 36062r1 | Method 23 TCDD/TCDF Analysis (DB-225)
Client Sample: COE-HG-AFTOUT-M23-R3 | Analysis File: X960746

Client Project:	COE Hot Gas Program				
Sample Matrix:	M23	Date Received:	02/06/96	Spike File:	SPC2NF04
TLI ID:	113-217-2A-E	Date Extracted:	02/07/96	ICal:	XF21266
		Date Analyzed:	02/29/96	ConCal:	X960733
Sample Size:	1.000	Dilution Factor:	n/a	% Moisture:	n/a
Dry Weight:	n/a	Blank File:	W018202	% Lipid:	n/a
GC Column:	DB-225	Analyst:	DB	% Solids:	n/a

Analytes	Amt. (ng)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	0.01			0.72	19:22	—

Internal Standard	Amt. (ng)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	1.7	43.7	40%-130%	0.80	19:20	—

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.78	18:24	—

Data Reviewer: Sue-Lewis 03/04/96

C2NF_PSR v1.14, LARS 6.03.09

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APPENDIX J

RESULTS OF AMBIENT AIR MONITORING FOR EXPLOSIVES

Air Monitoring Results
Hot-Gas Decontamination Validation Tests

All samples were analyzed for RDX, Tetryl and 2,4,6-TNT

Date	RFW #	Sample ID	Results
30-Jan-96			
	001	EAED29JAN96-1	Non-Detect
	002	EPED29JAN96-1	Non-Detect
	003	EPIM29JAN96-1	Non-Detect
	004	EPIM29JAN96-1	Non-Detect
	005	EPIS29JAN96-1	Non-Detect
	006	EPIS29JAN96-2	Non-Detect
	007	EAEU29JAN96-1	Non-Detect
	008	EAEU29JAN96-1	Non-Detect
3-Feb-96			
	001	EPIS31JAN96-2	Non-Detect
	002	EPIS31JAN96-2	Non-Detect
	003	EPIM31JAN96-2	Non-Detect
	004	EPIM31JAN96-2	Non-Detect
	005	EAED31JAN96-2	Non-Detect
	006	EAED31JAN96-2	Non-Detect
	007	EAEU31JAN96-2	Non-Detect
	008	EAEU31JAN96-2	Non-Detect
10-Feb-96			
	001	TB06FEB97F	Non-Detect
	002	TB06FEB97B	Non-Detect
	003	BLO6FEB96F	Non-Detect
	004	BL06FEB96B	Non-Detect
	005	EPPM07FEB96F	Non-Detect
	006	EPPM07FEB96B	Non-Detect
	007	EPIM06FEB96-3F	Non-Detect
	008	EPIM06FEB96-3B	Non-Detect
	009	EPIS06FEB96-3F	Non-Detect
	010	EPIS06FEB96-3B	Non-Detect
	011	EAEU06FEB96-3F	Non-Detect
	012	EAEU06FEB96-3B	Non-Detect
	013	EAED06FEB96-3F	Non-Detect
	014	EAED06FEB96-3B	Non-Detect
	015	EPPS07FEB96F	Non-Detect
	016	EPPS07FEB96B	Non-Detect
12-Feb-96	004	XAED12FEB96-1	Non-Detect
	005	XAEU12FEB96-1	Not-Detect
15-Feb-96	006	XAEU15FEB96-2	Not-Detect
	007	XAED15FEB96-2	Not-Detect
20-Feb-96	002	XAEU20FEB96-3	Not-Detect
	003	XAED20FEB96-3	Not-Detect

Sample I.D. Code:

E	A	E	D	29JAN96
(E) Explosive (X) Particulate (A) Asbestos	(P) Personal (A) Area	(I) Initial (P) Post (E) Eight Hour Sample	(S) Spiking - Matt (M) Maintenance - Vu (U) Upwind (D) Downwind (C) Center	Date of Sampling

TB - Trip Blank
BL - Field Blank

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MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: COE-HOT GAS
RFW #: 9602L978

W.O. #: 02281-012-012-9999-00
Date Received: 08 February 1996

EXPLOSIVE

1. The set of samples consisted of six (6) air samples collected on 30 January 1996.

2. The samples were prepared on 13 February 1996 and analyzed for Explosives by OSHA Method 44, modified for HPLC analysis on 14,16 February 1996.

3. Laboratory control limits were not available for assessing spike recoveries.

Bruce C. [illegible] unit leader

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-22-96
Date

cs/jkd/misc/02-978.ex

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates spiked compound.

Roy F. Weston, Inc. - Lionville Laboratory
Explosives by HPLC / Method 8330 — Report Date: 02/19/96 15:24

RFW Batch Number: **9602L978** — Client: **COE-HOT GAS** — Work Order: **02281-012-012-9999-00** — Page: 1

Sample Information							
	Cust ID:	**EAED29JAN96-1**	**EPED29JAN96-1**	**EPIM29JAN96-1**	**EPIM29JAN96-1**	**EPIS29JAN96-1**	**EPIS29JAN96-1**
	RFW#:	**001**	**002**	**003**	**004**	**005**	**006**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

Sample Information							
	Cust ID:	**EAEU29JAN96-1**	**EAEU29JAN96-1**	**BLANK-1**	**BLANK-1**	**TRIP BLANK-1**	**TRIP BLANK-1**
	RFW#:	**007**	**008**	**009**	**010**	**011**	**012**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Gr 2/20/96

Sample Information						
Cust ID:	**BLK**		**BLK BS**		**BLK BSD**	
RFW#:	**96LLC023-MB1**		**96LLC023-MB1**		**96LLC023-MB1**	
Matrix:	AIR		AIR		AIR	
D.F.:	1.00		1.00		1.00	
Units:	total ug		total ug		total ug	
RDX	0.20	U	87	%	89	%
Tetryl	0.15	U	14	%	13	%
2,4,6-Trinitrotoluene	0.050	U	26	%	33	%

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

2/20/96

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/08/96 RFW LOT # :9602L978

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
EAED29JAN96-1	001	AI	96LLC023	01/30/96	02/13/96	02/16/96
EPED29JAN96-1	002	AI	96LLC023	01/30/96	02/13/96	02/16/96
EPIM29JAN96-1	003	AI	96LLC023	01/30/96	02/13/96	02/16/96
EPIM29JAN96-1	004	AI	96LLC023	01/30/96	02/13/96	02/16/96
EPIS29JAN96-1	005	AI	96LLC023	01/30/96	02/13/96	02/16/96
EPIS29JAN96-1	006	AI	96LLC023	01/30/96	02/13/96	02/14/96
EAEU29JAN96-1	007	AI	96LLC023	01/30/96	02/13/96	02/14/96
EAEU29JAN96-1	008	AI	96LLC023	01/30/96	02/13/96	02/14/96
BLANK-1	009	AI	96LLC023	01/30/96	02/13/96	02/14/96
BLANK-1	010	AI	96LLC023	01/30/96	02/13/96	02/14/96
TRIP BLANK-1	011	AI	96LLC023	01/30/96	02/13/96	02/14/96
TRIP BLANK-1	012	AI	96LLC023	01/30/96	02/13/96	02/14/96

LAB QC:

BLK	MB1	AI	96LLC023	N/A	02/13/96	02/14/96
BLK	MB1 BS	AI	96LLC023	N/A	02/13/96	02/14/96
BLK	MB1 BSD	AI	96LLC023	N/A	02/13/96	02/14/96

 Cor 2/20/96

WESTON Analytics Use Only
9602L978

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client COE HOT GAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-9999-00
Project Contact/Phone #
AD Project Manager Kelly Baker
QC SM Del TAT 21 Day
Date Rec'd 2/8/96 Date Due 2/29/96
Account # COE Hotgas

Refrigerator #		
#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb	Explosive (AIR SAMPLES) — INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	Explosive (WESTON Analytics Use Only: 0833C)
001/002	EAED29JAN96-1			Air	1/30/96		✓
003/004	EPIM29JAN96-1			Air	1/30/96		✓
005/006	EPIS29JAN96-1			Air	1/30/96		✓
007/008	EAEU29JAN96-1			Air	1/30/96		✓
009/010	BLANK-1			Air	1/30/96		✓
011/012	TripBlank-1			Air	1/30/96		✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1. Blank + TB not on orig COC
2. No date or time collected on
3. Blank or TB - used 1/30/96
4. unless otherwise notified
2/10/96 5. Changed Del to STD per SDR # 96C009
6.

WESTON Analytics Use Only

Samples were:
1) Shipped X or Hand Delivered
Airbill # 1687440093
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Orig rewritten

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	2/8/96	0930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record Y or N
NOTES:

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# Cooler# 381 596a

Temp = 14.9

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: COE-HOT GAS
RFW #: 9602L975

W.O. #: 02281-012-012-9999-00
Date Received: 08 February 1996

EXPLOSIVE

1. The set of samples consisted of six (6) air samples collected on 03 February 1996.

2. The samples were prepared on 13 February 1996 and analyzed for Explosives by OSHA Method 44, modified for HPLC analysis on 14,16 February 1996.

3. Laboratory control limits were not available for assessing spike recoveries.

Bruce O. Miller unit leader
for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-22-96
Date

cs/jkd/misc/02-975.ex

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

WESTON

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP	=	Indicates spiked compound.

Sample Information							
	Cust ID:	EPIS31JAN96-2	EPIS31JAN96-2	EPIM31JAN96-2	EPIM31JAN96-2	EAED31JAN96-2	EAED31JAN96-2
	RFW#:	001	002	003	004	005	006
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
		fl	fl	fl	fl	fl	fl
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

Sample Information							
	Cust ID:	EAEU31JAN96-2	EAEU31JAN96-2	BLANK-2	BLANK-2	TRIP BLANK-2	TRIP BLANK-2
	RFW#:	007	008	009	010	011	012
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
		fl	fl	fl	fl	fl	fl
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Cg 2/20/96

	Cust ID:	BLK	BLK BS	BLK BSD
Sample Information	RFW#:	96LLC023-MB1	96LLC023-MB1	96LLC023-MB1
	Matrix:	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00
	Units:	total ug	total ug	total ug
RDX		0.20 U	87 %	89 %
Tetryl		0.15 U	14 %	13 %
2,4,6-Trinitrotoluene		0.050 U	26 %	33 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

[illegible] 2/20/96

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/08/96 RFW LOT # :9602L975

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
EPIS31JAN96-2	001	AI	96LLC023	02/03/96	02/13/96	02/14/96
EPIS31JAN96-2	002	AI	96LLC023	02/03/96	02/13/96	02/14/96
EPIM31JAN96-2	003	AI	96LLC023	02/03/96	02/13/96	02/14/96
EPIM31JAN96-2	004	AI	96LLC023	02/03/96	02/13/96	02/14/96
EAED31JAN96-2	005	AI	96LLC023	02/03/96	02/13/96	02/14/96
EAED31JAN96-2	006	AI	96LLC023	02/03/96	02/13/96	02/14/96
EAEU31JAN96-2	007	AI	96LLC023	02/03/96	02/13/96	02/14/96
EAEU31JAN96-2	008	AI	96LLC023	02/03/96	02/13/96	02/16/96
BLANK-2	009	AI	96LLC023	02/03/96	02/13/96	02/16/96
BLANK-2	010	AI	96LLC023	02/03/96	02/13/96	02/16/96
TRIP BLANK-2	011	AI	96LLC023	02/03/96	02/13/96	02/16/96
TRIP BLANK-2	012	AI	96LLC023	02/03/96	02/13/96	02/16/96

LAB QC:

BLK	MB1	AI	96LLC023	N/A	02/13/96	02/14/96
BLK	MB1 BS	AI	96LLC023	N/A	02/13/96	02/14/96
BLK	MB1 BSD	AI	96LLC023	N/A	02/13/96	02/14/96

G 2/20/96

WESTON Analytics Use Only
9602L975

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: COE Flotgas
Est. Final Proj. Sampling Date:
Work Order #: 02281-012-012-9999-02
Project Contact/Phone #:
AD Project Manager: Tully Baker
QC: STD Del: [illegible] TAT: 21 Day
Date Rec'd: 2/8/96 Date Due: 2/29/96
Account #: COE Flotgas

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives
ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; Explosives; INORG: Metal, CN

Air [illegible]

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	Explosives
											8330
001/002	EPIS31JAN96-2			Air	2/3/96						✓
003/004	EPIM31JAN96-2										
005/006	EAED31JAN96-2										
007/008	EAEU31JAN96-2										
009/010	BLANK-2										
011/012	TRIPBlank-2										

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
EXPLOSIVES = RDX, Tetryl, TNT

orig rewritten

DATE/REVISIONS:
1. Rec'd Blank + TB not
2. on orig COC
3. No Date or Time collected on
4. TB + Blank - used 2/3/96
5. unless otherwise notified
2/20/96 6. Changed Del 1 to STD per [illegible]

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	2/8/96	9:30

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

WESTON Analytics Use Only

Samples were:
1) Shipped X or Hand Delivered
Airbill # 1168740935
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

Temp = 14.9°C

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: COE-HOT GAS
RFW #: 9602L084

W.O. #: 02281-012-012-9999-00
Date Received: 15 February 1996

EXPLOSIVE

1. The set of samples consisted of eight (8) air samples collected on 10 February 1996.

2. The samples were prepared on 20 February 1996 and analyzed for Explosives by OSHA Method 44, modified for HPLC analysis on 21 February 1996.

3. All required holding times for extraction and analysis were met.

4. All initial calibrations associated with this data set were within acceptance criteria.

5. All continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.

6. Laboratory control limits were not available for assessing spike recoveries.

Bruce C. Phillips unit leader

FOR J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-23-96
Date

cs/jkd/misc/02-084.ex

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 6 pages.

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP	=	Indicates spiked compound.

Roy F. Weston, Inc. - Lionville Laboratory
Explosives by HPLC / Method 8330

RFW Batch Number: **9602L084** Client: **COE-HOT GAS** Work Order: **02281-012-012-9999-00** Report Date: 02/22/96 12:02 Page: 1

Sample Information	Cust ID:	**TB06FEB97F**	**TB06FEB97B**	**BL06FEB96F**	**BL06FEB96B**	**EPPM07FEB96F**	**EPPM07FEB96B**
	RFW#:	**001**	**002**	**003**	**004**	**005**	**006**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

Sample Information	Cust ID:	**EPIM06FEB96-3F**	**EPIM06FEB96-3B**	**EPIS06FEB96-3F**	**EPIS06FEB96-3B**	**EAEU06FEB96-3F**	**EAEU06FEB96-3B**
	RFW#:	**007**	**008**	**009**	**010**	**011**	**012**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Sample Information							
	Cust ID:	**EAED06FEB96-3F**	**EAED06FEB96-3B**	**EPPS07FEB96F**	**EPPS07FEB96B**	**BLK**	**BLK BS**
	RFW#:	**013**	**014**	**015**	**016**	**96LLC029-MB1**	**96LLC029-MB1**
	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	71 %
Tetryl		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	10 %
2,4,6-Trinitrotoluene		0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	32 %

Sample Information		
	Cust ID:	**BLK BSD**
	RFW#:	**96LLC029-MB1**
	Matrix:	AIR
	D.F.:	1.00
	Units:	total ug
RDX		65 %
Tetryl		10 %
2,4,6-Trinitrotoluene		71 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 02/15/96 RFW LOT # :9602L084

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
TB06FEB97F	001	AI	96LLC029	02/10/96	02/20/96	02/21/96
TB06FEB97B	002	AI	96LLC029	02/10/96	02/20/96	02/21/96
BL06FEB96F	003	AI	96LLC029	02/10/96	02/20/96	02/21/96
BL06FEB96B	004	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPPM07FEB96F	005	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPPM07FEB96B	006	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPIM06FEB96-3F	007	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPIM06FEB96-3B	008	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPIS06FEB96-3F	009	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPIS06FEB96-3B	010	AI	96LLC029	02/10/96	02/20/96	02/21/96
EAEU06FEB96-3F	011	AI	96LLC029	02/10/96	02/20/96	02/21/96
EAEU06FEB96-3B	012	AI	96LLC029	02/10/96	02/20/96	02/21/96
EAED06FEB96-3F	013	AI	96LLC029	02/10/96	02/20/96	02/21/96
EAED06FEB96-3B	014	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPPS07FEB96F	015	AI	96LLC029	02/10/96	02/20/96	02/21/96
EPPS07FEB96B	016	AI	96LLC029	02/10/96	02/20/96	02/21/96

LAB QC:

BLK	MB1	AI	96LLC029	N/A	02/20/96	02/21/96
BLK	MB1 BS	AI	96LLC029	N/A	02/20/96	02/21/96
BLK	MB1 BSD	AI	96LLC029	N/A	02/20/96	02/21/96

WESTON Analytics Use Only
9602L084

Custody Transfer Record/Lab Work Request

WESTON — Page 1 of 1

Client: ~~USAEC~~ COE-Hotgas
Est. Final Proj. Sampling Date: 3/11/96
Work Order #: 02281-012-012-9999-00
Project Contact/Phone #:
AD Project Manager: Kelly Baker
QC: STD Del: ~~EP~~ STD TAT: 21 Day
Date Rec'd: 2/15/96 Date Due: 3/7/96
Account #: COE Hotgas

Refrigerator #		
#/Type Container	Liquid	
	Solid	
Volume	Liquid	
	Solid	
Preservatives		
ANALYSES REQUESTED →	ORGANIC: VOA, BNA, Pest/PCB, Herb; 8330	INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	8330 (WESTON Analytics Use Only)
001/002	TB06FEB~~97~~97			Air	2/10/96		✓
003/004	BL06FEB~~96~~96						ID on tube read BL06FEB97
005/006	EPPM07FEB96						
007/008	EPIM06FEB96-3						
009/010	EPIS06FEB96-3						
011/012	EAEU06FEB96-3						
013/014	EAED06FEB96-3						
015/016	EPPS07FEB96						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
TNT, Tetryl, ~~RDX~~ RDX

Original rewritten

DATE/REVISIONS:
1. See Above ID discrepancy
2/20/96 2. changed Del to STD per SOW
3. 96LC009
4.
5.
6.

Relinquished by	Received by	Date	Time
Rocky	Amore	2/15/96	930

Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: (See Above)

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill #
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Cooler# N/A
Temp = 4.6°C

RFW 21-21-001/A-7/91 L372 L373 L375 L377 L378 Ref# 381-596a

Roy F. Weston, Inc.
208 Welsh Pool Road
Lionville, Pennsylvania 19341-1333
610-701-6100 • Fax 610-701-6140

WESTON
MANAGERS DESIGNERS/CONSULTANTS

LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: COE-HOT GAS
RFW #: 9603L267

W.O. #: 02281-012-012-9999-00
Date Received: 01 March 1996

EXPLOSIVE

1. The set of samples consisted of seven (7) air samples collected on 14,17,22,26 February 1996.

2. The samples and their associated QC samples were prepared on 07 March 1996 and analyzed for Explosives by methodology based on EPA Method 8330 on 09 March 1996.

3. Laboratory control limits were not available for assessing spike recoveries.

Bruce C. Miller unit leader
for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

3-13-96
Date

cs/jkd/misc/03-267.ex

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 5 pages.

WESTON MANAGERS DESIGNERS/CONSULTANTS

GLOSSARY OF EXPLOSIVE DATA

DATA QUALIFIERS

U	=	Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
J	=	Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
I	=	Interference.

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP	=	Indicates spiked compound.

Roy F. Weston, Inc. - Lionville Laboratory

Explosives by HPLC / Method 8330 Report Date: 03/12/96 12:03

RFW Batch Number: **9603L267** Client: **COE-HOT GAS** Work Order: 02281012012 Page: 1

	Cust ID:	**TRIP BLANK**	**XAEU20FEB96-3**	**XAED20FEB96-3**	**XAED12FEB96-1**	**XAEU12FEB96-1**	**XAEU15FEB96-2**
Sample	RFW#:	**001**	**002**	**003**	**004**	**005**	**006**
Information	Matrix:	AIR	AIR	AIR	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	total ug	total ug	total ug	total ug	total ug	total ug
RDX		4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Tetryl		3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
2,4,6-Trinitrotoluene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

	Cust ID:	**XAED15FEB96-2**	**BLK**	**BLK BS**
Sample	RFW#:	**007**	**96LLC044-MB1**	**96LLC044-MB1**
Information	Matrix:	AIR	AIR	AIR
	D.F.:	1.00	1.00	1.00
	Units:	total ug	total ug	total ug
RDX		4.0 U	4.0 U	87 %
Tetryl		3.0 U	3.0 U	73 %
2,4,6-Trinitrotoluene		1.0 U	1.0 U	83 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Roy F. Weston, Inc. - Lionville Laboratory
8330 ANALYTICAL DATA PACKAGE FOR
COE-HOT GAS

DATE RECEIVED: 03/01/96

RFW LOT # :9603L267

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
TRIP BLANK	001	AI	96LLC044	02/26/96	03/07/96	03/09/96
XAEU20FEB96-3	002	AI	96LLC044	02/22/96	03/07/96	03/09/96
XAED20FEB96-3	003	AI	96LLC044	02/22/96	03/07/96	03/09/96
XAED12FEB96-1	004	AI	96LLC044	02/14/96	03/07/96	03/09/96
XAEU12FEB96-1	005	AI	96LLC044	02/14/96	03/07/96	03/09/96
XAEU15FEB96-2	006	AI	96LLC044	02/17/96	03/07/96	03/09/96
XAED15FEB96-2	007	AI	96LLC044	02/17/96	03/07/96	03/09/96

LAB QC:

BLK	MB1	AI	96LLC044	N/A	03/07/96	03/09/96
BLK	MB1 BS	AI	96LLC044	N/A	03/07/96	03/09/96

WESTON Analytics Use Only

96D3L267

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client USAEC COE-HOTGAS
Est. Final Proj. Sampling Date
Work Order # 02281-012-012-9999-00
Project Contact/Phone #
AD Project Manager KAB
QC STD Del STD TAT 21 Day
Date Rec'd 3/1/96 Date Due 3/22/96
Account # USHotgas

Refrigerator #
#/Type Container: Liquid / Solid
Volume: Liquid / Solid
Preservatives

ANALYSES REQUESTED: ORGANIC (VOA, BNA, Pest/PCB, Herb); Expl (2 Air Canisters); INORG (Metal, CN)

WESTON Analytics Use Only: 08330

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	08330 (Expl)
001	Trip Blank			Air	02/24/96	1700	X
002	XAEU20FEB96-3				02/22/96	2100	X
003	XAED20FEB96-3				02/22/96	2100	X
004	XAED12FEB96-1				02/14/96	0700	X
005	XAEU12FEB96-1				02/14/96	0700	X
006	XAEU15FEB96-2				02/17/96	0200	X
007	XAED15FEB96-2				02/17/96	0200	X

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
08330 = ROX, Tetryl, TNT

Cooler N/A 8.3

DATE/REVISIONS:
1. no airbill received
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FedEx	D. Smith	3/1/96	9:30				

WESTON Analytics Use Only

Samples were:
1) Shipped X or Hand Delivered
Airbill # 2249241285 / 2549240161
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

APPENDIX K

AMBIENT AIR MONITORING RESULTS FOR ASBESTOS

WESTON
MANAGERS DESIGNERS/CONSULTANTS

ROY F. WESTON, INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (334) 826-6100
FAX: (334) 826-8232

PHASE CONTRAST MICROSCOPY RESULTS

Weston W.O. No. 02281-012-012-9999
Receipt Date 03/18/96 through 03/18/96

WESTON ID	CLIENT/CLIENT ID	DATE RECEIVED	VOLUME (liters)	FIBER COUNT	FIBERS /mm² *	DETECTION LIMIT	FIBERS / cc	CONFIDENCE LIMITS
DS013	USAEC/AAEU	03/18/96	763	9.0	10.00	0.003	0.005	0.003 - 0.013
DS014	USAEC/AAED	03/18/96	830	1.0	< 7.00	0.003	< 0.003	0.003 - 0.003
DS015	USAEC/APIS	03/18/96	102	3.5	< 7.00	0.026	< 0.026	0.026 - 0.046
DS016	USAEC/AFIELDBLANK	03/18/96	0	1.0	BLANK	--	--	-

TDTC = Too Dirty To Count SNA = Sample Not Analyzed * Corrected for Blank Count If Blank was Received
Limit of Quantification = 5.5 Fibers / 100 Fields

Results Approved for Transmittal by:

March 27, 1996

Upon issue, this report may be reproduced only in full and relates only to the items tested. Results were obtained following procedures in NIOSH 7400, Revision #3, 5/15/89. The WESTON Optical Microscopy Laboratory in Auburn, AL. is accredited by AIHA (Laboratory No. 9224).

INDUSTRIAL HYGIENE SAMPLING DATA

CLIENT: USAEC

PROJECT LOCATION: AAAP

DATE: 11 MAR 96

WORK ORDER: 02281-012-012-9999-00

SAMPLE NUMBER: AAEU/LAB ID# D5013 LOT # 9-028

HYGIENIST: Vu Huynh

PUMP CALIBRATION DATA

PUMP ID 512648

CALIBRATION METHOD

- ☐ Bubble Burette
- ☒ Precision Rotameter
- ☐ Field Rotameter
- ☐ Critical Orifice

	Date	C.Time	Vol	E.Time	Flow
Initial CAL.	3/11	0730	—	—	1.591
Final CAL.	3/11	1630	—	—	1.590

MEAN FLOW: 1.590 L/min

SAMPLING MEDIA

- ☐ Adsorption Tube
  - ☐ Charcoal
  - ☐ Tenax
  - ☐ Silica
- ☒ Cassette
  - ☐ 37 mm
  - ☐ 25 mm
  - ☐ MCE
  - ☐ PVC
  - ☒ 0.8 µm
  - ☐ 0.4 µm
  - ☐ Open Face
  - ☐ Std. Cowl
- ☐ Other ______ (Type)

MPLE TYPE

- ☒ Ambient
  - ☒ Work Area
  - ☐ Adjacent RM
  - ☐ Background
- ☐ Personnel
  - Name:
  - ID #:
  - Task:
- ☐ TWA Sample
- ☐ Other

PUMP OPERATION

START TIME: 0800
STOP TIME: 1600
2ND START:
2ND STOP:
TOTAL TIME: 480 minutes
VOLUME: 763 L

SAMPLE MANAGEMENT

HANDLING

- ☐ Cold Storage
- ☐ Vibration Sensitive
- ☐ Hand Carry Only

ANALYTICS

- ☒ NIOSH Method 7400
- ☐ OSHA Method
- ☐ Other

ANALYTES

Asbestos

CHAIN OF CUSTODY

RECEIVED BY	RELINQUISHED BY	DATE	TIME
Vu Huynh	Vu Huynh	3/11	1800
Shannon Blair	FED EX	03-13-96	1600
A. Murph	Brian Benson	3-18-96	1000

LABORATORY

- ☐ AUBURN IH LAB
  ROY F. WESTON INC.
  1635 PUMPHREY AVE.
  AUBURN, AL 36830
  ATTN: BRIAN BENSON
- ☒ OTHER Lionville

SV:C:\INDHYG\IHDATA.FRM

INDUSTRIAL HYGIENE SAMPLING DATA

CLIENT: USAEC

PROJECT LOCATION: AAAP

DATE: 11 MAR 96

WORK ORDER: 02281-012-012-9999-00

SAMPLE NUMBER: AAED/ LAB ID# D9014 LOT#9-028

HYGIENIST: Vu Huynh

PUMP CALIBRATION DATA

PUMP ID 512848

CALIBRATION METHOD

- ☐ Bubble Burette
- ☒ Precision Rotameter
- ☐ Field Rotameter
- ☐ Critical Orifice

	Date	C.Time	Vol	E.Time	Flow
Initial CAL.	3/11	0730	—	—	1.731
Final CAL.	3/11	1630	—	—	1.730

MEAN FLOW: 1.730 L/min

SAMPLING MEDIA

- ☐ Adsorption Tube
  - ☐ Charcoal
  - ☐ Tenax
  - ☐ Silica
- ☒ Cassette
  - ☐ 37 mm
  - ☐ 25 mm
  - ☐ MCE
  - ☐ PVC
  - ☒ 0.8 µm
  - ☐ 0.4 µm
  - ☐ Open Face
  - ☐ Std. Cowl
- ☐ Other ______ Type

SAMPLE TYPE

- ☒ Ambient
  - ☒ Work Area
  - ☐ Adjacent RM
  - ☐ Background
- ☐ Personnel
  - Name:
  - ID #:
  - Task:
- ☐ TWA Sample
- ☐ Other

PUMP OPERATION

START TIME: 0800 2ND START: TOTAL TIME: 480 min

STOP TIME: 1600 2ND STOP: VOLUME: 830 Liters.

SAMPLE MANAGEMENT

HANDLING

- ☐ Cold Storage
- ☐ Vibration Sensitive
- ☐ Hand Carry Only

ANALYTICS

- ☒ NIOSH Method 7400 Sheets
- ☐ OSHA Method
- ☐ Other

ANALYTES

CHAIN OF CUSTODY

RECEIVED BY	RELINQUISHED BY	DATE	TIME
Vu Huynh	Vu Huynh	3/11	1800
Shannon Bla[illegible]	FED EX	03-13-96	1600
[illegible].Murph	Brian Benson	3-18-96	1000

LABORATORY

☐ AUBURN IH LAB
ROY F. WESTON INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
ATTN: BRIAN BENSON

☒ OTHER Lionville

SV:C:\INDHYG\IHDATA.FRM

610-701-5028 APIS

INDUSTRIAL HYGIENE SAMPLING DATA

CLIENT: USAEC
PROJECT LOCATION: AAAP
DATE: 11 MAR 96

WORK ORDER: 02281-012-012-9999-00
SAMPLE NUMBER: AAED / LABID# DS015 LOT#9-628
HYGIENIST: Vu Huynh

PUMP CALIBRATION DATA

PUMP ID 512848

CALIBRATION METHOD

- ☐ Bubble Burette
- ☒ Precision Rotameter
- ☐ Field Rotameter
- ☐ Critical Orifice

	Date	C.Time	Vol	E.Time	Flow
Initial CAL.	03/11	0430	–	–	1.690
Final CAL.	03/11	0930	–	–	1.700

MEAN FLOW: 1.700 L/min

SAMPLING MEDIA

- ☐ Adsorption Tube
  - ☐ Charcoal
  - ☐ Tenax
  - ☐ Silica
- ☒ Cassette
  - ☐ 37 mm
  - ☐ 25 mm
  - ☐ MCE
  - ☐ PVC
  - ☒ 0.8 µm
  - ☐ 0.4 µm
  - ☐ Open Face
  - ☐ Std. Cowl
- ☐ Other ______ Type

SAMPLE TYPE

- ☐ Ambient
  - ☐ Work Area
  - ☐ Adjacent RM
  - ☐ Background
- ☒ Personnel
  - Name: Kevin Almedist
  - ID #: ______
  - Task: ______
- ☐ TWA Sample
- ☐ Other ______

PUMP OPERATION

START TIME: 0800 2ND START: TOTAL TIME: 60 minutes
STOP TIME: 0900 2ND STOP: VOLUME: 102 Liters

SAMPLE MANAGEMENT

HANDLING
- ☐ Cold Storage
- ☐ Vibration Sensitive
- ☐ Hand Carry Only

ANALYTICS
- ☒ NIOSH Method 7400 Asbestos
- ☐ OSHA Method ______
- ☐ Other ______

ANALYTES
______

CHAIN OF CUSTODY

RECEIVED BY	RELINQUISHED BY	DATE	TIME
Vu Huynh	Vu Huynh	03/11	1800
Shannon Blair	FED EX	03-13-96	1600
A. Murph	Brian Benson	3-18-96	1000

LABORATORY

☐ AUBURN IH LAB
ROY F. WESTON INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
ATTN: BRIAN BENSON

☒ OTHER Lionville

SV:C:\INDHYG\IHDATA.FRM

*Note This C.O.C.'s information does not belong with any of the four cannisters sent. Also, one of the four cannisters is missing a C.O.C.

INDUSTRIAL HYGIENE SAMPLING DATA

CLIENT: USAEC

PROJECT LOCATION: AAAP

DATE: 03/11/96

WORK ORDER: 02281-012-012-9999-00

SAMPLE NUMBER: AFIELDBLANK

LABID# DS016

HYGIENIST: LOT# 9-02B

PUMP CALIBRATION DATA

PUMP ID —

CALIBRATION METHOD

- ☐ Bubble Burette
- ☐ Precision Rotameter
- ☐ Field Rotameter
- ☐ Critical Oriface

	Date	C.Time	Vol	E.Time	Flow
Initial CAL.	—	—	—	—	—
Final CAL.	—	—	—	—	—

MEAN FLOW:

SAMPLING MEDIA

- ☐ Adsorption Tube
  - ☐ Charcoal
  - ☐ Tenax
  - ☐ Silica
- ☒ Cassette
  - ☐ 37 mm
  - ☐ 25 mm
  - ☐ MCE
  - ☐ PVC
  - ☒ 0.8 µm
  - ☐ 0.4 µm
  - ☐ Open Face
  - ☐ Std. Cowl
- ☐ Other ________ (Type)

SAMPLE TYPE

- ☐ Ambient
  - ☐ Work Area
  - ☐ Adjacent RM
  - ☐ Background
- ☐ Personnel
  - Name:
  - ID #:
  - Task:
- ☐ TWA Sample
- ☒ Other Field Blank

PUMP OPERATION

START TIME: — 2ND START: — TOTAL TIME: —

STOP TIME: — 2ND STOP: — VOLUME. —

SAMPLE MANAGEMENT

HANDLING	ANALYTICS	ANALYTES
☐ Cold Storage	☐ NIOSH Method 7400	Asbestos
☐ Vibration Sensitive	☐ OSHA Method	
☐ Hand Carry Only	☐ Other	

CHAIN OF CUSTODY

RECEIVED BY	RELINQUISHED BY	DATE	TIME
Vu Huynh	Vu Huynh	03/11/96	1800
Shannon Blair	FED EX	03-13-96	1600
A. Murph	Brian Benson	3-18-96	1000

LABORATORY

☐ AUBURN IH LAB
ROY F. WESTON INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
ATTN: BRIAN BENSON

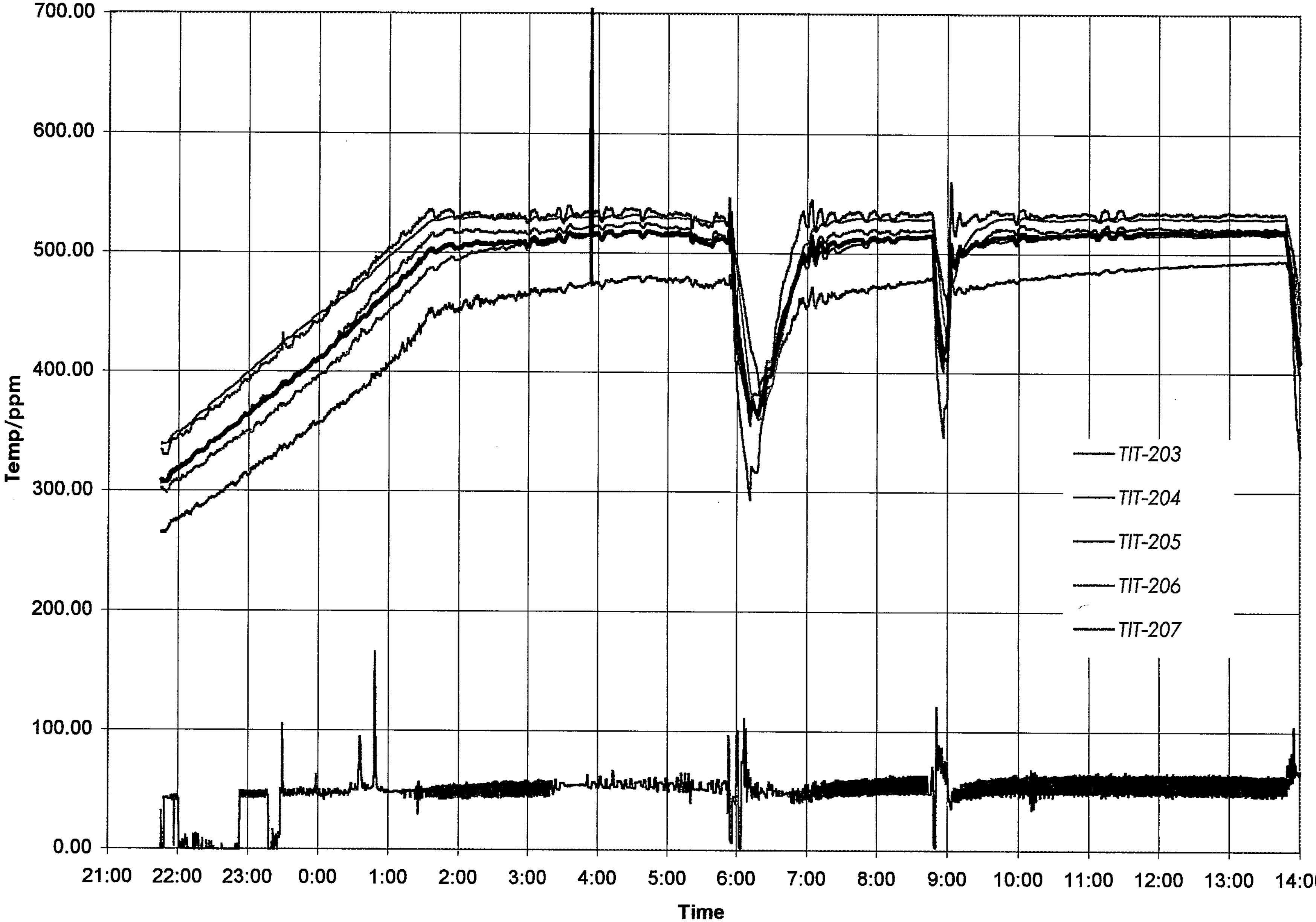
☒ OTHER Lionville

SV:C:\INDHYG\IHDATA.FRM

APPENDIX L

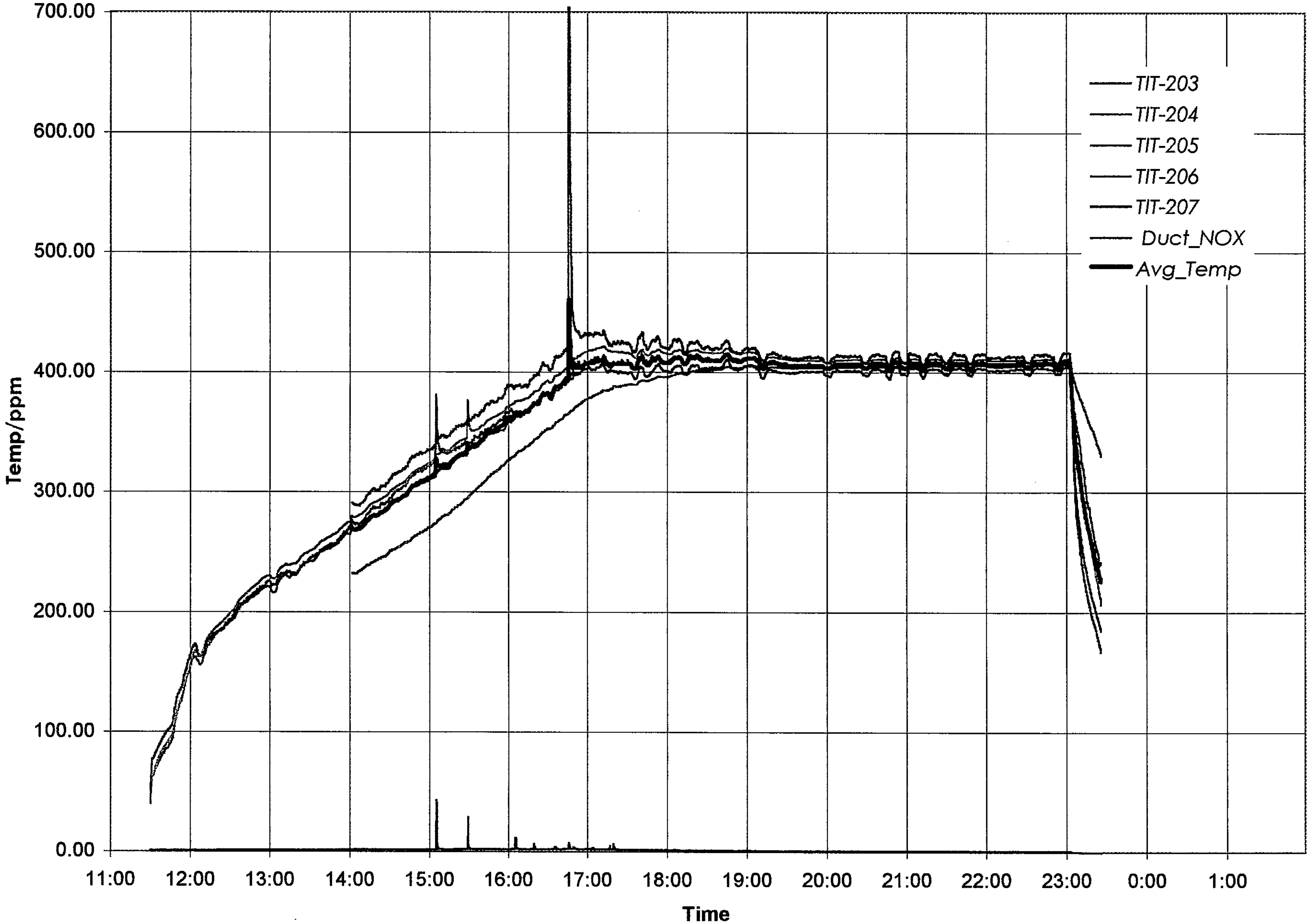
NO_X EMISSIONS TRENDS IN THE FURNACE EXIT GASES FOR TEST RUNS 1-15

TEST#1: NOx and Temperature

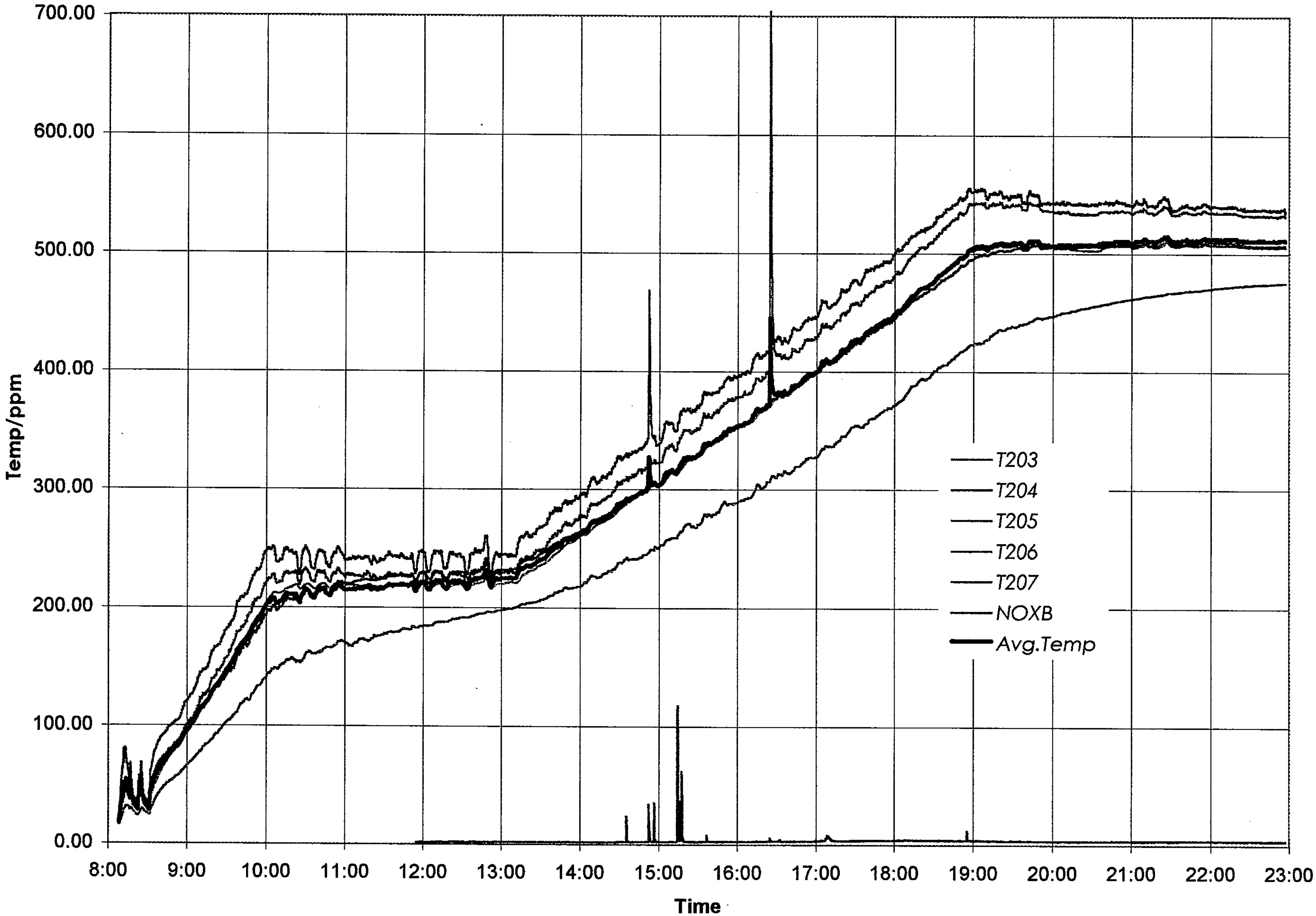


2/22/96

TEST#2: NOx and Temperature

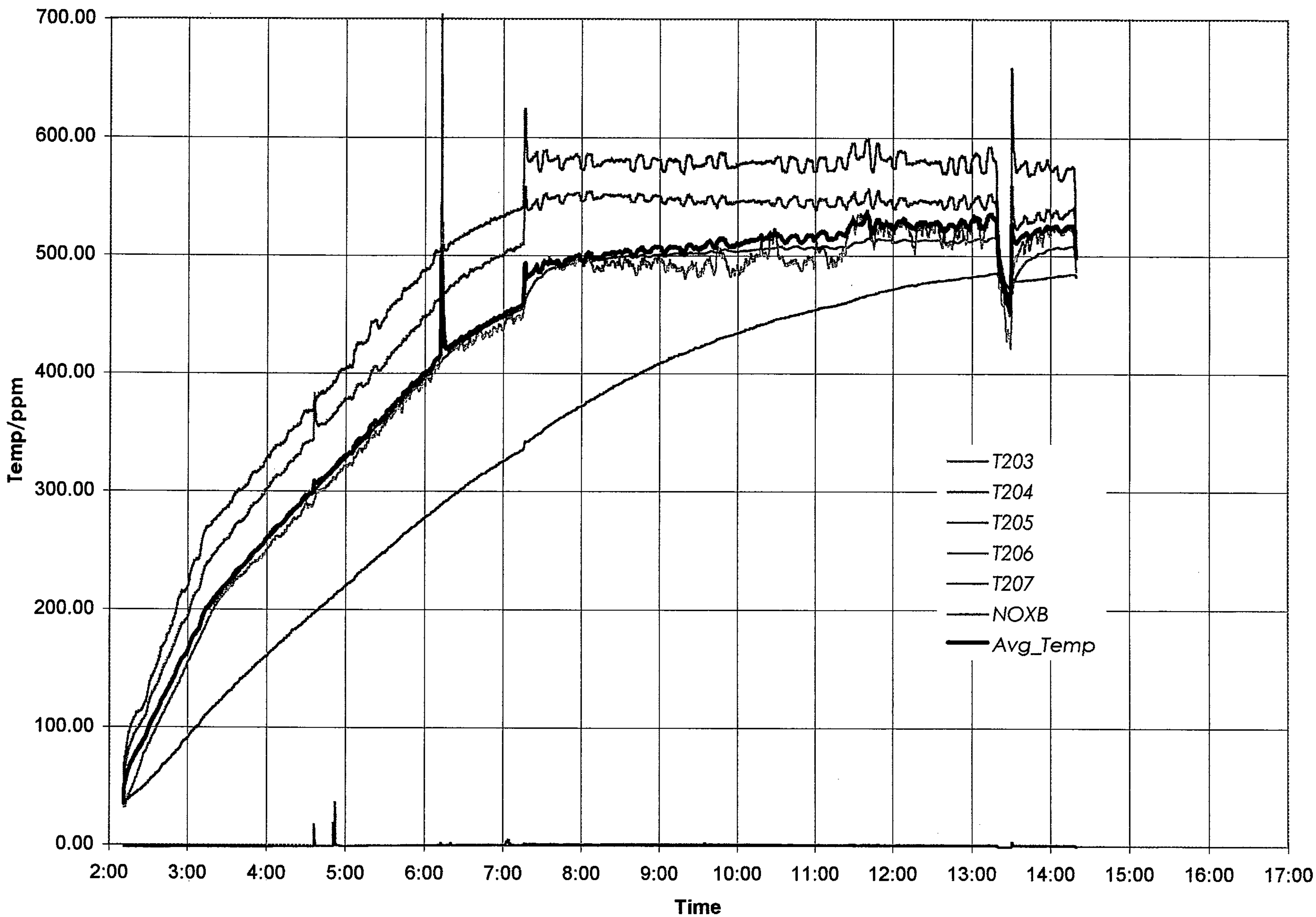


TEST#3: NOx and Temperature

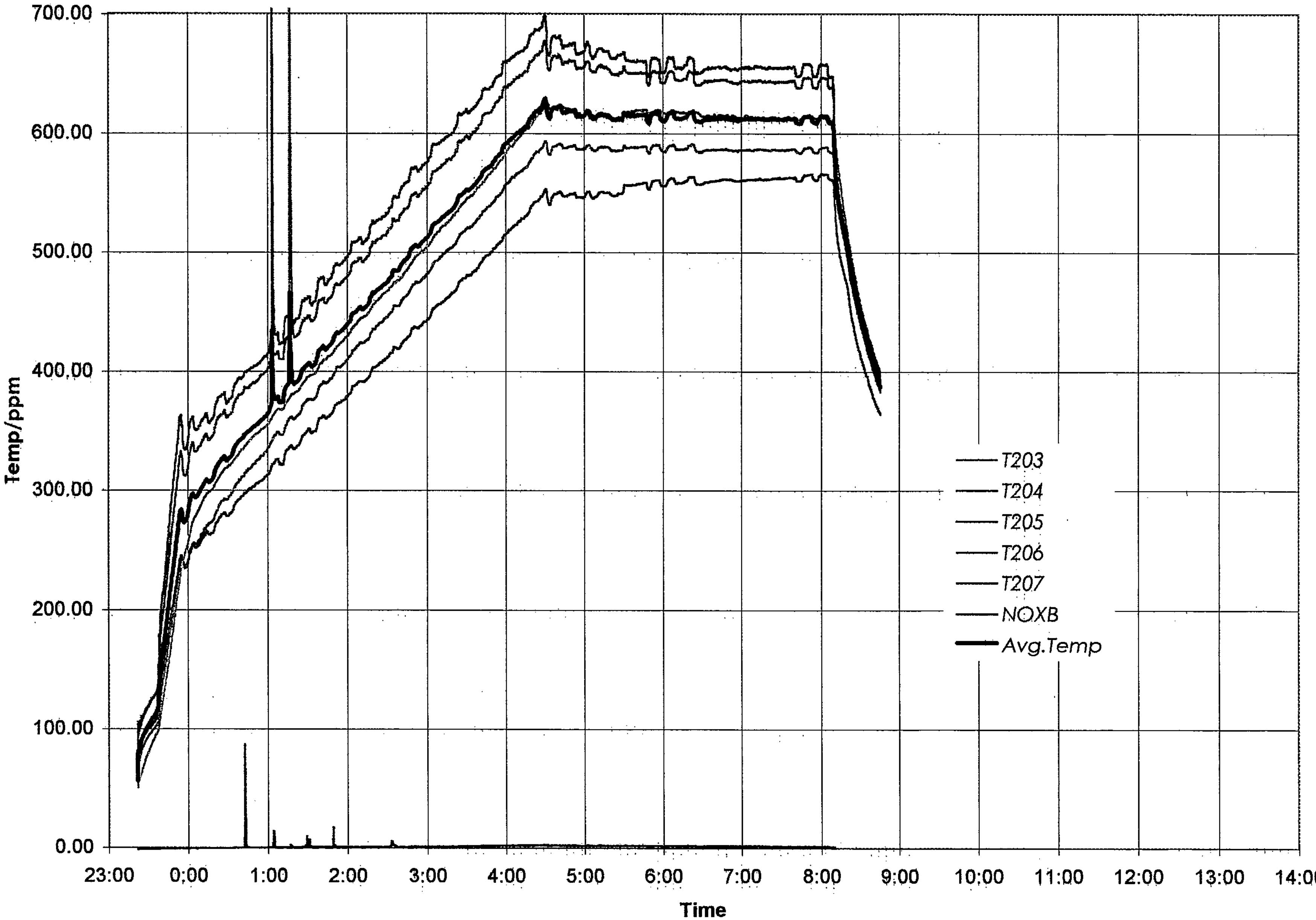


2/22/96

TEST#4: NOx and Temperature

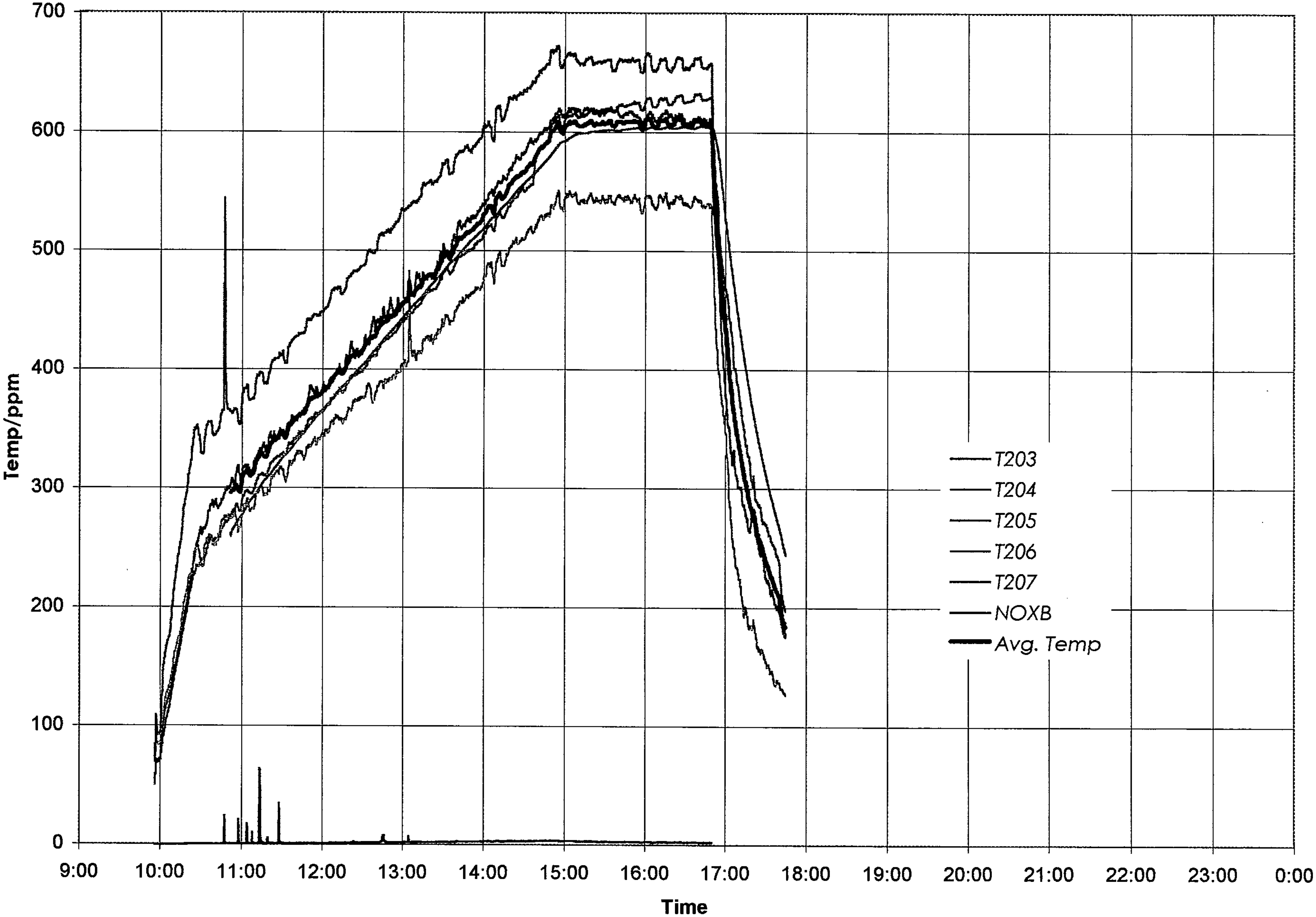


TEST#5: NOx and Temperature

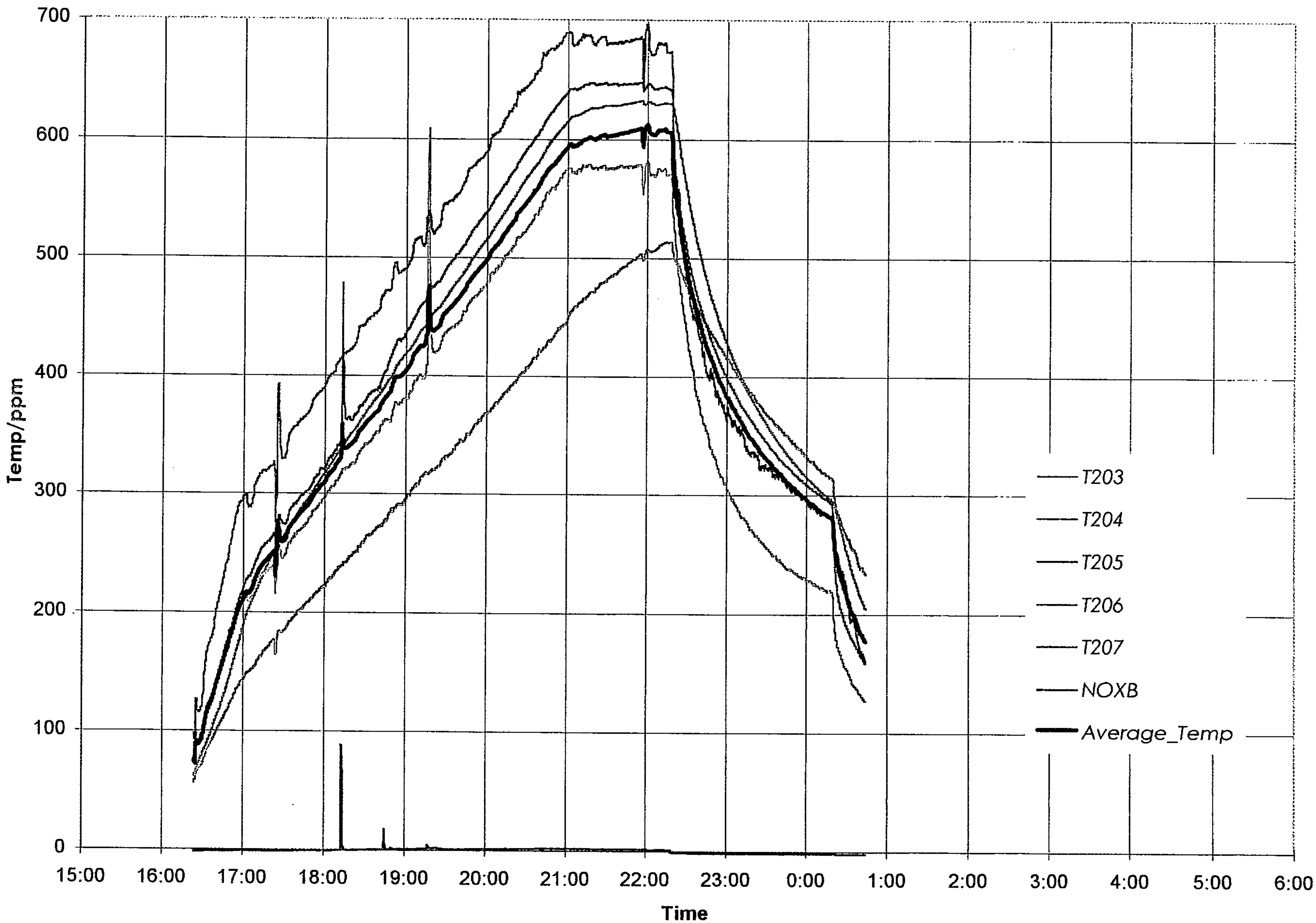


2/22/96

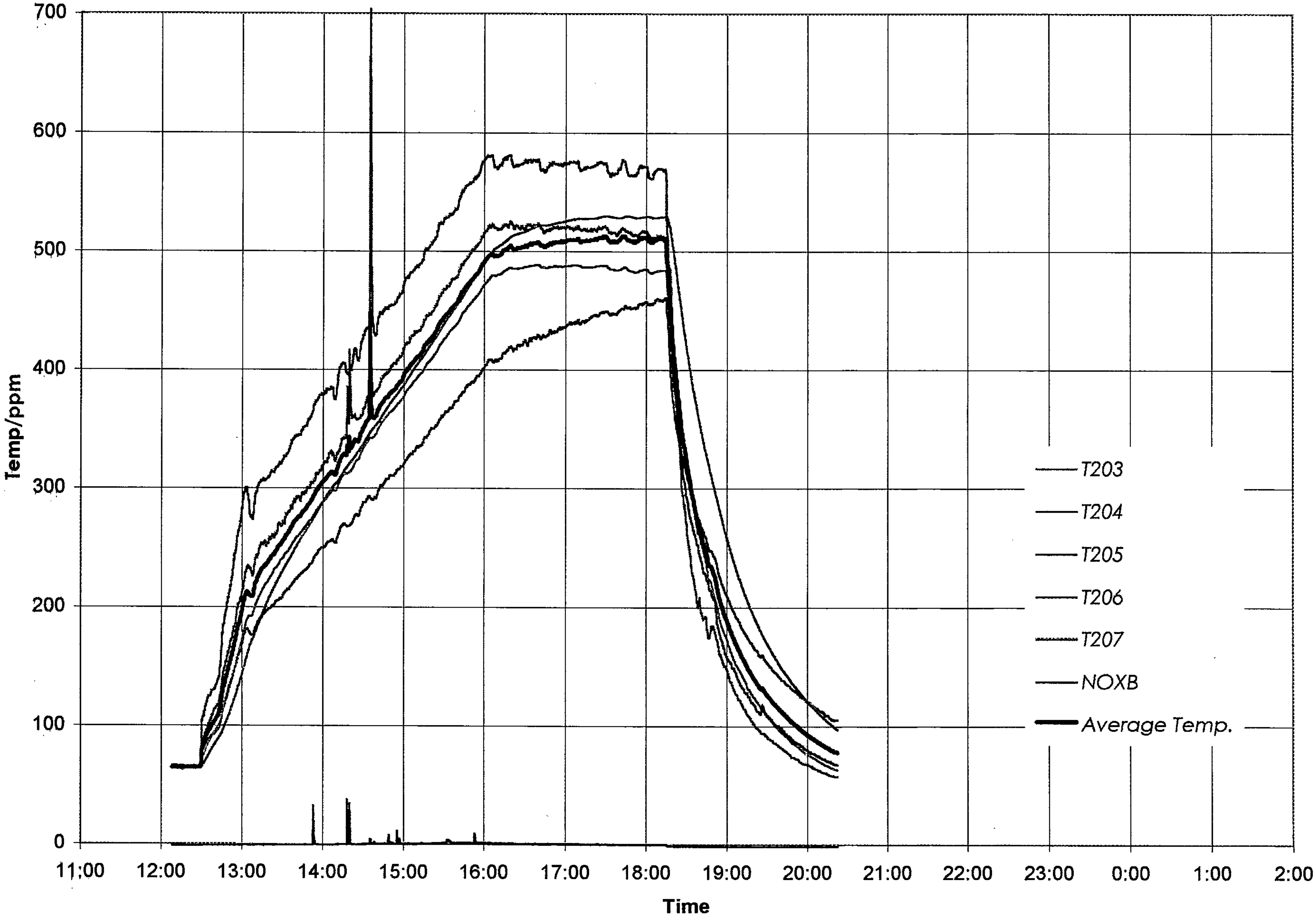
TEST#6: NOx and Temperature



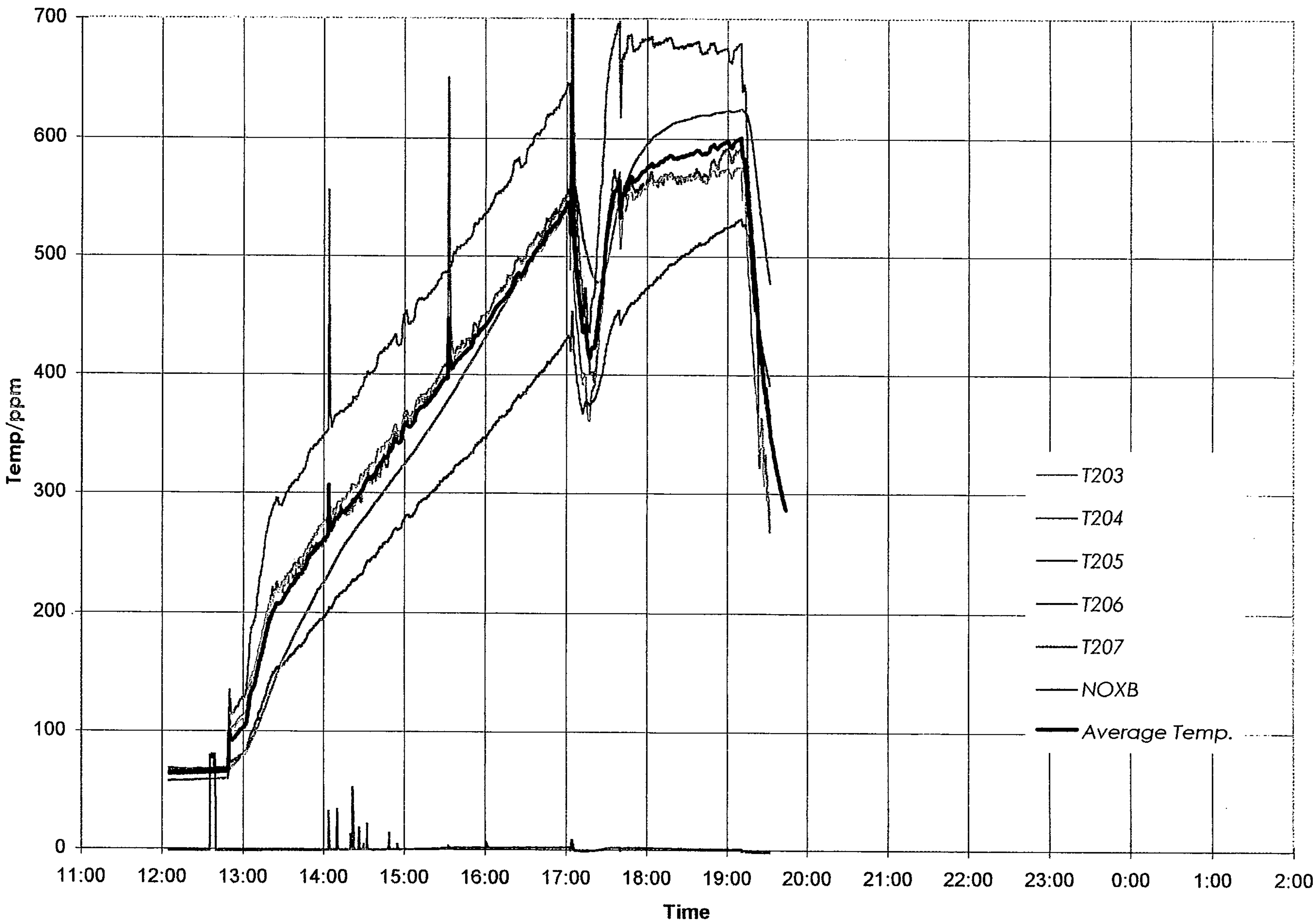
TEST#7: NOx and Temperature



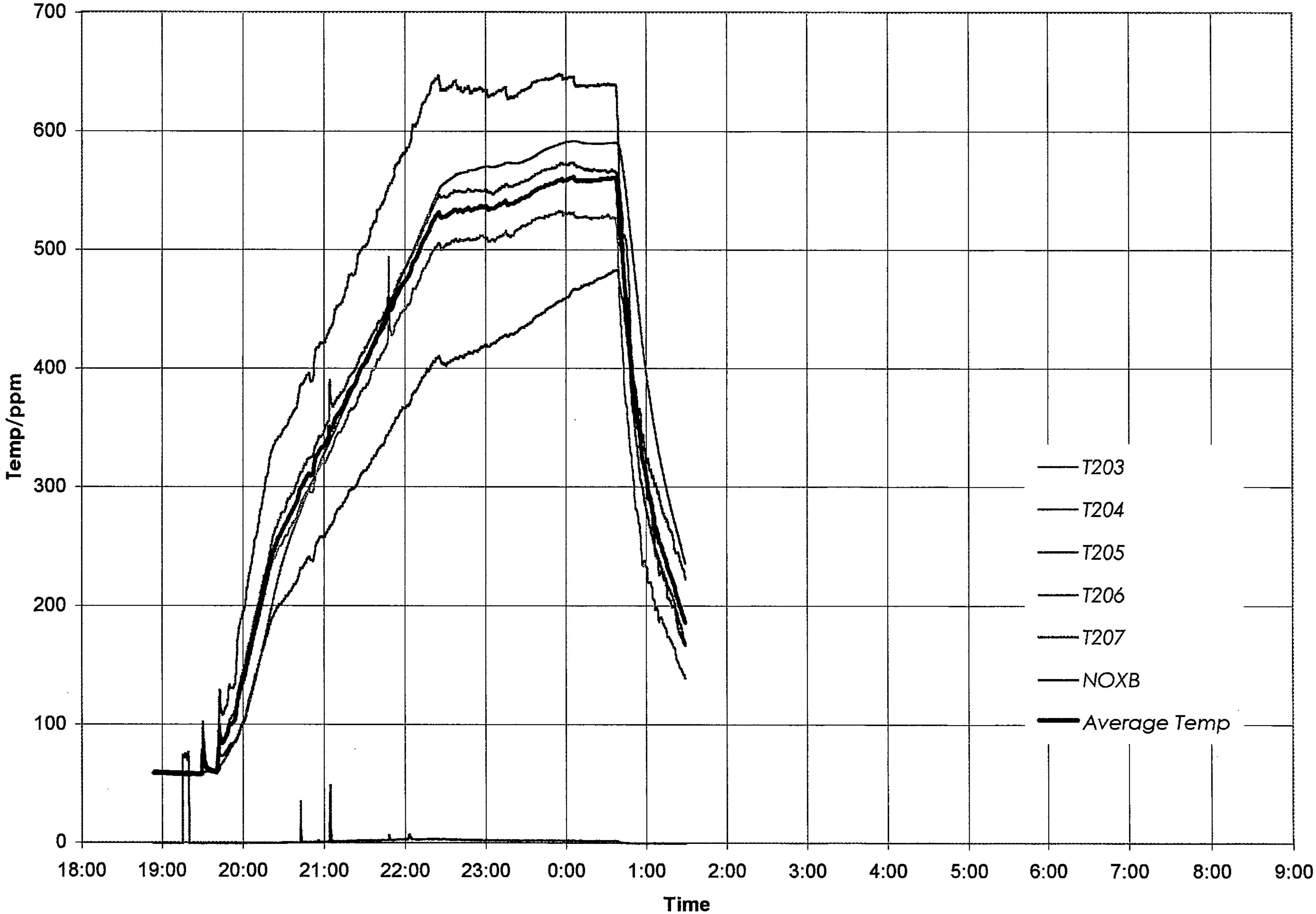
TEST#8: NOx and Temperature



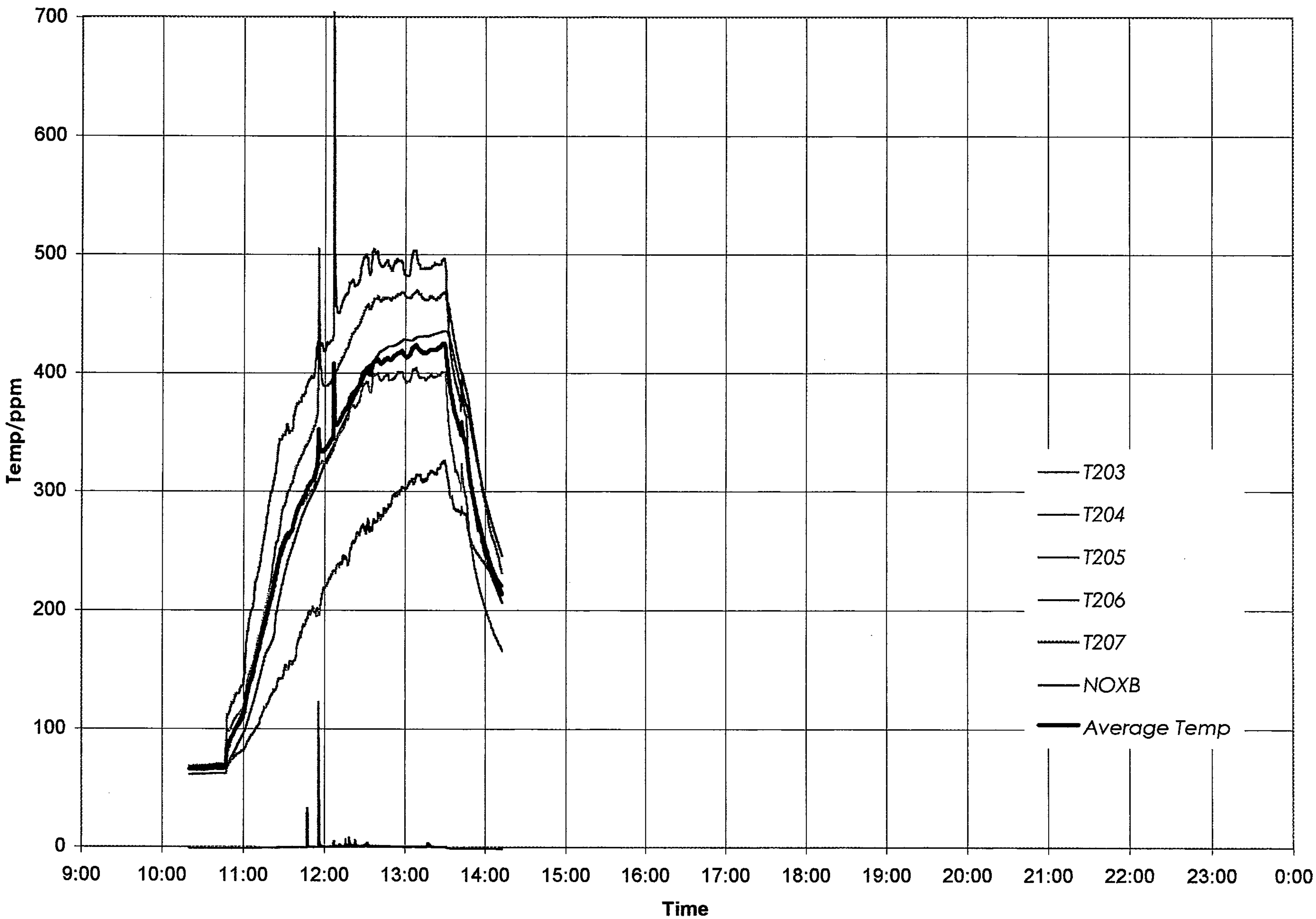
TEST#9: NOx and Temperature



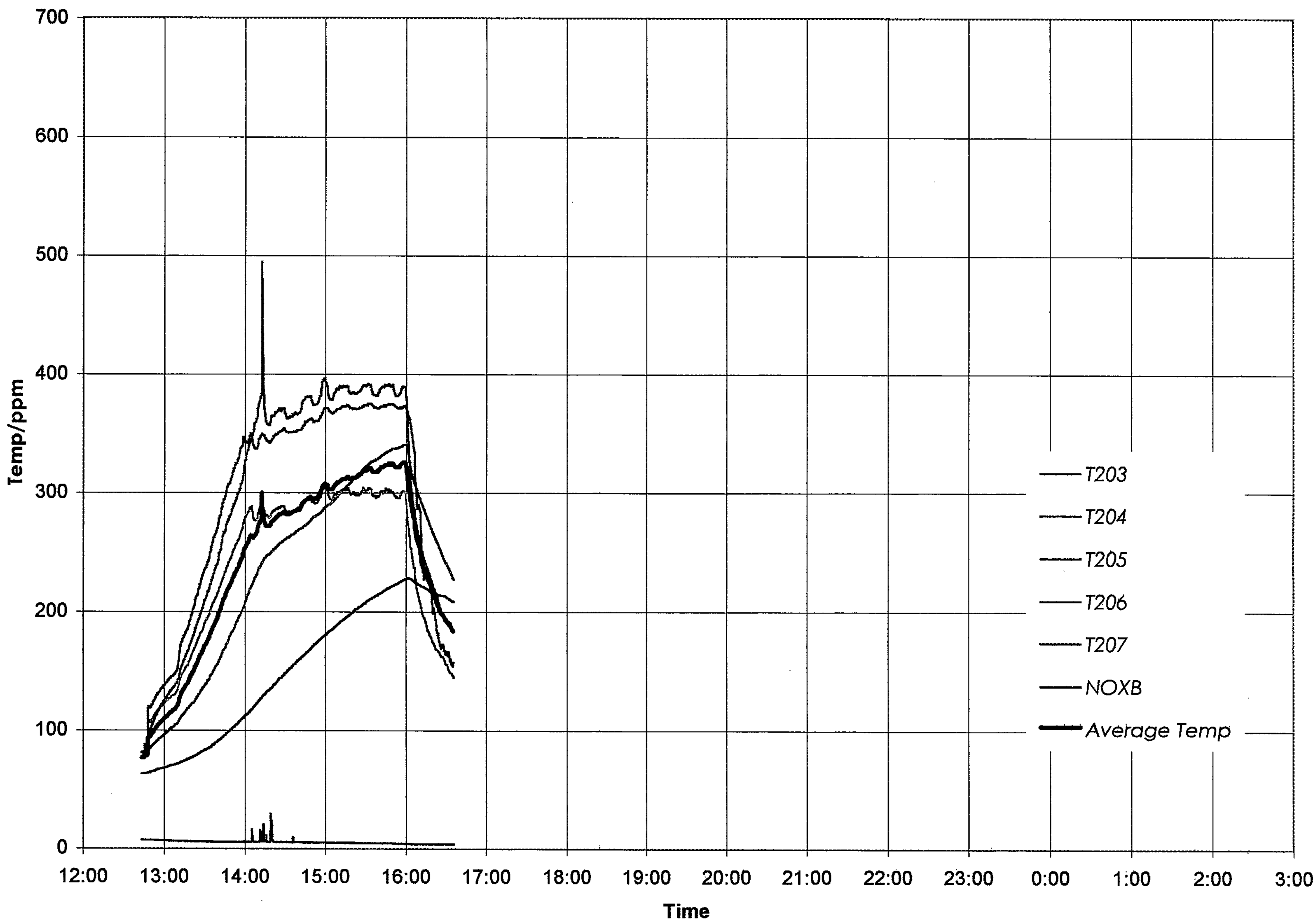
TEST#10: NOx and Temperature



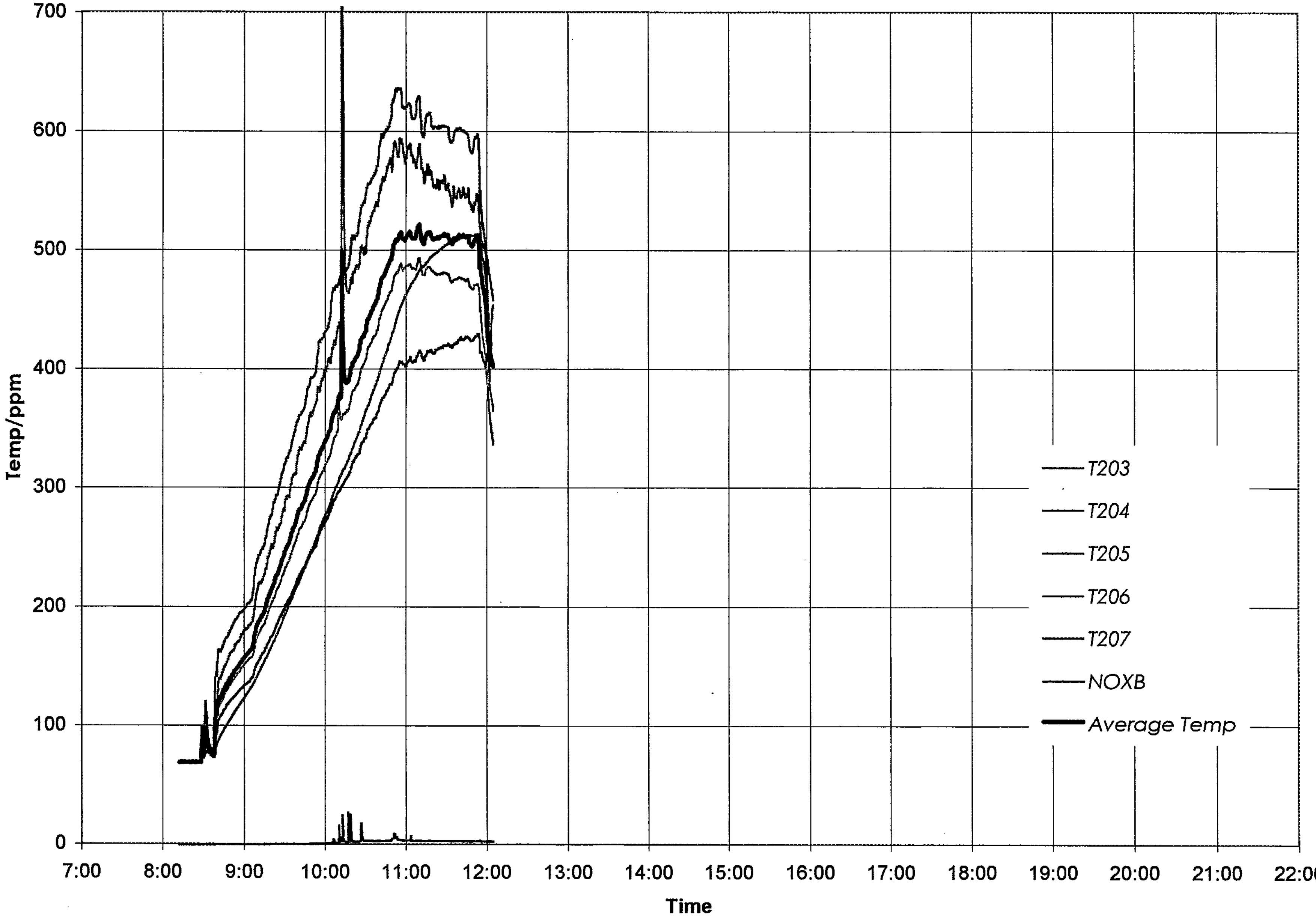
TEST#11: NOx and Temperature



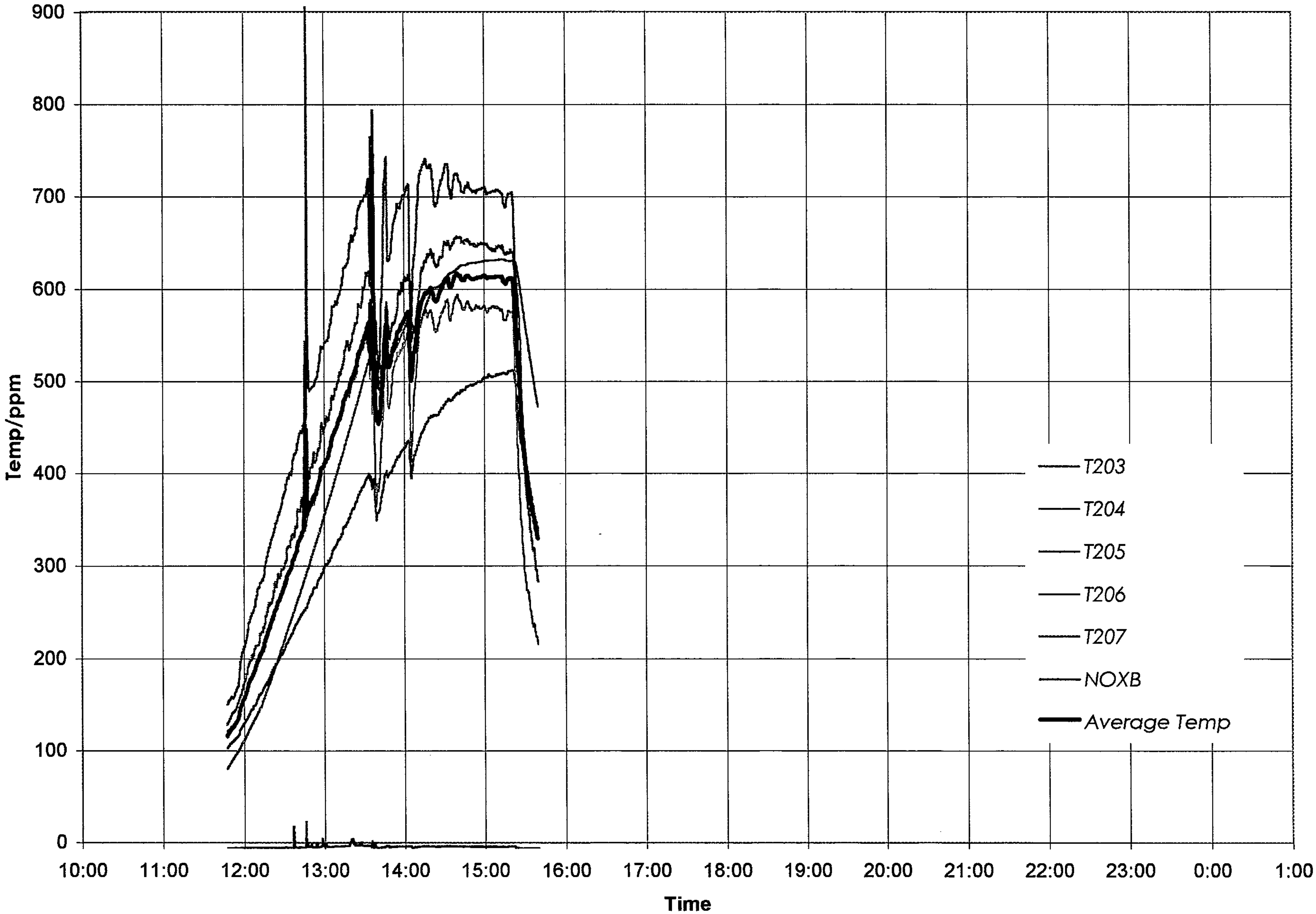
TEST#12: NOx and Temperature



TEST#13: NOx and Temperature



TEST#14: NOx and Temperature



TEST#15: NOx and Temperature